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DEFENSE INTELLIGENCE AGENCY

GROUND FORCES R&D RESOURCES-PRC: THE RESEARCH, DEVELOPMENT, TEST, AND EVALUATION ACTIVITIES OF THE PEOPLE'S REPUBLIC OF CHINA; EXECUTIVE SUMMARY (U)

PREPARED BY
US ARMY
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Section I.

INTRODUCTION AND HISTORICAL REVIEW

1. (U) Introduction

a. (U) In the words of a recent Defense Intelligence Agency summary, "The armament industry of the People's Republic of China (PRC) has come of age."[1] * The capability of the People's Liberation Army (PLA) ground forces is being improved, not only by increased quantities of ground forces materiel, but by a greater variety of domestically produced weapons. While essentially the entire PRC ground-weapon inventory for many years has consisted of copies of Soviet weapons, there has been a growing development program ongoing in the PRC. Analysis of the apparent PRC developmental strategy for ground-force systems included in section III, reveals continuing heavy dependence on the copying of Soviet weapon systems, but supplemented by an increasing capability to create substantive design modifications and indigenous designs. Such a design strategy has not, to date, required the development of an extensive research, development, test, and evaluation (RDTE) resources base.

b. (U) This increasing indigenous capability to design and develop armaments for ground forces has emerged during the same period during which the PRC became a nuclear power, developed a midrange ballistic missile (MRBM) system, approached development of an intercontinental ballistic missile (ICBM) system, developed an advanced supersonic aircraft of native design, and launched earth satellites. Intelligence studies seeking to identify and analyze the PRC resources base and management system supporting the research and development of these advanced systems have described an elaborate infrastructure for military R&D, coordinated and directed by the National Defense Science and Technology Commission (NDSTC), an agency of the PRC Ministry of National Defense (MND) and PLA.

c. (U) Initial assumptions, that the NDSTC was responsible for all areas of PRC military R&D, have been somewhat tempered by growing indications that in operational terms, at least, RDTE efforts supporting conventional armaments and munitions may be organized and conducted differently than those for advanced weapon systems. It is postulated that research, design, and development efforts for conventional ground-force armaments and munitions probably are organized, sited, and managed primarily within the infrastructure of the Fifth Ministry of Machine Industry (MMI). The intrinsic differences between the RDTE requirements for advanced systems and those of improved conventional weapons further suggest the existence of two distinct management systems.

*Reference numbers refer to items in the bibliography.

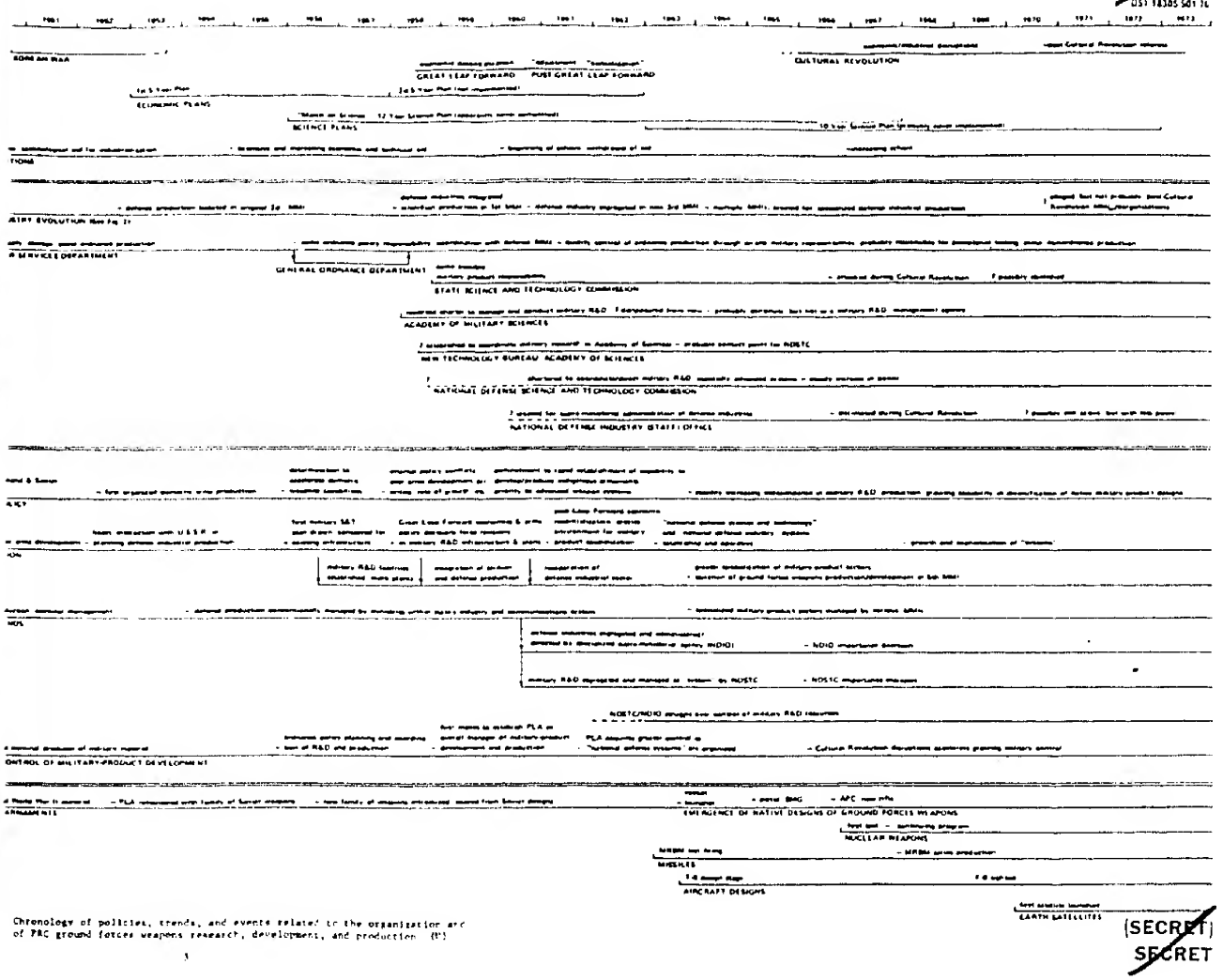
2. (S) Summary of Major Trends

a. (U) The following discussion examines the evolution of PRC policies regarding the organization and management of military-product research, design, and development (and how that policy evolution has affected the management and conduct of RDTE activities for ground-force weapons and materiel). A graphic representation of this analysis is included as figure 1.

b. (U) Disregarding short-term shifts, Communist Chinese policy with respect to military R&D has followed, successively, two fundamental directions. In the first years of the regime, the PRC depended heavily upon material aid and guidance from the Soviet Union, followed the Soviet model in the creation of institutions and management systems, and conducted very little innovative military R&D; most of its effort was concentrated on copying Soviet designs and adapting them for Chinese production. In the late 1950s and early 1960s, policy followed a new course leading to the assumption of ambitious, long-range, native military R&D programs within a characteristically Chinese system of organizing and managing military technological development.

c. (U) While economic considerations played a part in this change, the principal motivations appear to have been political. First, it probably was inevitable that the Chinese could not accept permanently an arrangement that placed the PRC as a satellite and a dependent of the USSR in international affairs. Strong Chinese nationalism and ethnocentrism made continued acceptance of Soviet guidance and the copying of Soviet methods anathematic. Additionally, international considerations eventually brought the Chinese to believe that they had to have a military force comparable to those of the USSR and the West in advanced weapon systems. Soviet reluctance to help the PRC achieve such parity only accelerated the Chinese drive to have economic and technological independence. At the same time, internal political considerations probably influenced these policy decisions. That is, the PLA long has been the keystone of Communist power in China, and it is not surprising to find the PRC leadership choosing to place important development programs under the umbrella of that politically more reliable agency. Except for temporary aberrations, that policy has been pursued consistently in the last decade, and the trend does not appear to have been arrested by the Cultural Revolution.

d. (U) At the conclusion of the Chinese Civil War, the PLA was primarily an infantry force lightly equipped with captured (Japanese and US) equipment. The economic, industrial, and manpower resources available immediately after 1949 were so limited that any significant military R&D program was too formidable an undertaking, and, besides, the first priority of the PRC government at that time was national reconstruction.



Chronology of policies, trends, and events related to the organization and of PRC ground forces weapons research, development, and production (U)

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e. (U) The entry of the PRC into the Korean War, and the unpleasant experiences and problems with equipment encountered by the PLA, was to have a profound influence on the Chinese defense industry. Although the PRC still relied heavily upon the USSR for both materiel and technical expertise, it was at this time that the Chinese began to organize a significant indigenous defense industry. The Second MMI was created in 1952 as a defense industrial agency, and various civilian plants and military arsenals that previously had been engaged primarily in the overhaul and repair of equipment began also to produce a volume of arms and equipment copied from Soviet designs.

f. (U) (C) The years 1956 and 1958 were pivotal with respect to both the overall scientific and technical R&D effort in China and to its military R&D programs. In the first half of 1956, the State Planning Committee and the State Technology Commission were organized under the State Council for the purpose of planning and coordinating science and technology throughout the PRC. Also in 1956, the PLA Ordnance Department (previously a subdivision of the General Rear Services Department) was elevated to the status of a general department and given increased responsibilities, including, in part, the development of ordnance policy; research, design, development, and production of some weapons and munitions; and coordination of ordnance production in industrial ministries.[2] It is apparent that the PRC approach to organizing military R&D still followed the Soviet model, wherein the R&D base was to be centered in the industrial ministries that produced the material, while the military establishment guided development and then tested and accepted the output.

g. (U) (S) In 1958, however, a series of events took place that clearly indicated that the Chinese were making radical alterations in policies and programs involving military technological development. Much of what transpired with respect to the defense development sector in 1958 was inextricably mingled with the major economic reforms generated by the Great Leap Forward. This was particularly the case with the defense industry. The Second MMI was merged with the First MMI, effecting an integration of defense production with the civilian industrial sector, while overall industrial management was considerably decentralized, along with much of the general economy. At the same time, the formal military establishment began to assume a more direct and active role in the conduct of military R&D as well as in its direction and coordination. Further, it appears that the PRC leadership had decided to make a "great leap" in defense technology; that is, to acquire as rapidly as possible advanced weapon systems, including nuclear weapons, ballistic missiles, and superior aerosystems. Among the events of 1958 that underscored these trends were:

- Establishment, within the MND, of the Academy of Military Sciences (AMS), presumably with subordinate research facilities. There was a concurrent downgrading and alteration of the mission of the General Ordnance Department.

- Establishment of the New Technology Bureau (NTB) within the Academy of Sciences, reportedly to monitor military research projects in Academy facilities.

- Creation, through the merger of the Science Planning Committee and the State Technology Commission, of the State Science and Technology Commission (which was subordinate to the State Council) under Nieh Jung-chen. The commission's basic mission was the coordination of general R&D at all levels throughout the PRC, but it probably also was responsible for coordinating some portion of the military R&D effort, particularly that in facilities outside the military establishment.

- It is also possible the agency which subsequently has become known as the National Defense Science and Technology Commission of the PLA (NDSTC) was organized at this time.

h. (U/~~C~~) By 1960, the economic policies of the Great Leap Forward had left the PRC economy in a chaotic state, and the PRC leadership began to recentralize the management of the economy. This was reflected in the defense sector by the reseparation of the defense industry from the nondefense counterpart. The Third MMI was created in 1960, and it incorporated all of the primary military-product sectors, except the nuclear development program, which remained under the Second MMI. It is assumed that it was at this time that the National Defense Industry Office (NDIO) was established, to oversee the development of the PRC defense industrial system.

i. (U/~~C~~) By no later than 1962, a secret organization including several research academies and other facilities had been established to work on the development and production of missiles. This organization eventually surfaced in 1965 as the Seventh MMI. The R&D base supporting the defense industrial system continued to expand after 1960, and an overall trend toward industrial specialization resulted in the establishment in 1963 of the Fourth, Fifth, and Sixth MMI from elements of the First and Third MMI. These organs, as well as the Second and Third MMI and the "shadow ministry" that became the Seventh MMI, evidently came under the jurisdiction of the NDIO for most matters, but were at the

same time subject to some direction or control by the NDSTC, this certainly being the case in affairs related to "advanced" R&D. The general product responsibilities for these MMI are shown in figure 2. The ground forces related responsibilities of these ministries are: Second MMI—tactical nuclear weapons; Third MMI—helicopters, light aircraft (probable), and surface-to-air missiles; Fourth MMI—tactical communications and radar equipment; Sixth MMI—small boats (possible); and Seventh MMI—short-range ballistic missiles (probable).

j. (U) (C) PLA ground forces are supplied with materiel and equipment developed and produced by several industrial ministries other than the Fifth MMI and the other defense MMI listed in figure 2. Some organizations known or suspected to be among these additional suppliers are: First MMI (wheeled vehicles, general light and heavy machinery, tools, electrical equipment, generators, and possibly engineer equipment); the Fuel and Chemical Industry Ministry (POL, and possibly chemical agents and explosives); and the Ministries of Light Industry, Communications, Building Materials, Building Construction, and Metallurgical Industry.

k. (S) From 1965 to 1973 the PRC placed heavy dependence on free world imports to build an indigenous weapon R&D and production capability. The abrupt Soviet withdrawal in 1960 had left the PRC industrial base seriously deficient in many of the critical technological areas required for the development of modern weaponry. [redacted]

3. (U) (C) Conflict Over Control of the PRC Military R&D System

a. According to information contained in Red Guard literature, the mid-1960s was a time of struggle among elements of the PRC leadership for control of the defense R&D sector. As long as the NDSTC exercised control over the largest and best industrial R&D resources, it appeared that these resources would be utilized primarily for the development of advanced systems. If, on the other hand, the various defense ministries were allowed to manage their respective R&D resources independently, they could then more easily dedicate R&D resources to the particular missions and goals of their own sectors. The overriding factor in this policy struggle was the conflict between the NDSTC and the NDIO over the control of the R&D resources of the entire defense industrial infrastructure.

b. Clearly, the leadership of the defense industry sector was, by mid-1965, partially successful in reacquiring significant jurisdiction over some of the leading facilities involved in military R&D, and in compromising the authority or influence of the NDSTC and of Nieh Jung-chen as "overlord" of the defense R&D sector. This power struggle might have

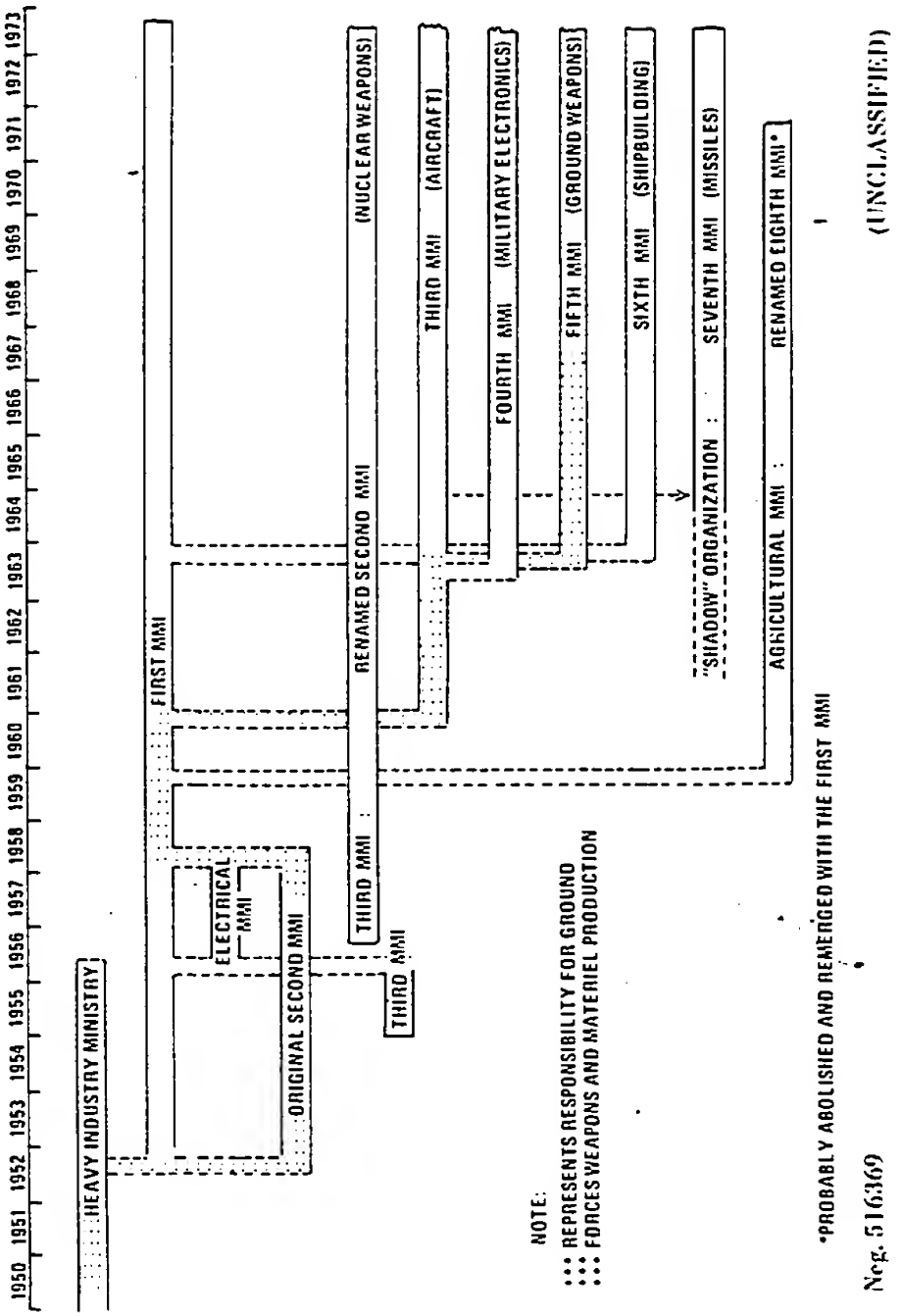

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Figure 2. Chronological development and responsibilities of the Ministries of Machine Industry (U).

continued, but the advent of the Cultural Revolution was a new factor that removed from the scene the major personalities in the conflict, and had the effect of accelerating the overriding trend: viz, to bring the entire PRC defense R&D system under more direct control of the formal military establishment. To maintain order and continuity in priority defense R&D programs during the Cultural Revolution, the PRC leadership was forced to put many research and industrial organizations and facilities under temporary military control. Such moves probably have resulted in the elimination of any substantial remaining opposition to the primacy of the military establishment within these sectors.

c. Limited post-Cultural Revolution information indicates that the NDSTC continues as a "leading agency" of the PLA, still with the primary mission of coordinating R&D efforts directed toward the development of advanced weapon systems. Virtually every reference to the NDSTC (dating from before, during, or after the Cultural Revolution) indicates interaction with agencies involved in advanced weapon development. There are no documented instances of the NDSTC's involvement with units of the Fifth MMI. That organ (and the other defense industrial ministries) survived the Cultural Revolution, but apparently they are under increased control of the MND and the PLA. The NDIO probably still operates as a formal administrative link between the central government and the defense industrial ministries. If so, the office is under new leadership and is directly controlled by the PLA. A graphic summary of the agencies vying for control of the defense industrial sector is shown in figure 3.

4. (U) Evolution of PRC Defense Industrial Ministries

In brief, these MMI evolved in a manner similar to the evolution of counterpart organizations in the USSR. A network of numbered state ministries, with specialized military-product responsibilities, emerged through subdivision of older industrial organizations, which had multiple responsibilities. In the PRC, the defense industry MMI evolved from elements of the Ministry of Heavy Industry that existed in the early 1950s. The numbered defense MMI evolved through several stages of subdivision toward increasing specialization. The greatest subdivision occurred in about 1963, resulting in the structure and responsibilities probably still existing today; however, further reorganizations might have occurred after the Cultural Revolution. The greatest (and the best documented) involvement in ground-weapon systems is found in the Fifth MMI, and it is toward this MMI that much of the subsequent analysis is addressed.

Defense Industrial Sector	Year	MND/PLA
Second and First MMIs merge--integration of defense and civilian industry.	1958 "Great Leap" in defense technology. Trend toward decentralization.	Establishment of: Academy of Military Sciences (AMS), New Technology Bureau (NTB),[1] State Science and Technology Commission, National Defense Science and Technology Commission (NDSTC).
Third MMI created, incorporating all military-product sectors (except nuclear development).	1960 Economic policies of "Great Leap Forward" fail. Trend toward recentralization.	National Defense Industry Staff Office (NDIO), established to oversee development of defense industrial system. PLA loses major responsibility for production of armaments/munitions.
Seventh MMI created.	1962 Initial trend toward specialization.	
Fourth, Fifth, and Sixth MMIs created.	1963 Continued trend toward specialization.	Conflict for control of military-product R&D infrastructure between NDIO-NDSTC.
Influence and control of defense industry sector increases.	1965 Increased use of imports to improve military R&D capabilities.	NDSTC influence diminishes.
MMIs for other than advanced weaponry retain essential control.	1966 Cultural Revolution Period.	Greater military control of industry. NDSTC regains influence in advanced weapons area. NDIO weakened, possibly extinct. State S&T Commission possibly abolished. Academy of Military Sciences--educational role only. PLA continues as a developer and customer [General Rear Services Department (GRSD)].

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Figure 3. Struggle and growth in the PRC defense R&D environment (U).

Section II.

CURRENT PRC MILITARY R&D ORGANIZATIONAL STRUCTURE, FUNCTIONS, AND ROLES IN GROUND-FORCE WEAPONS DEVELOPMENT

A. INTRODUCTION

(U) (C) The policy decisions and trends described in section I have resulted in the formation of a self-contained group of specialized defense industrial ministries with responsibility for specific weapon systems classes. These ministries, the Defense Ministries of Machine Industry (MMI), constitute the developer or supplier component in the PRC military R&D system. The previously mentioned policy decisions and trends have also caused new agencies to be established for the coordination and management of defense R&D (altering, downgrading, or eliminating the coordination-management roles of other agencies). Because of these changes, a brief review of the estimated contemporary missions (or lack thereof) of several organizations (which, at one time or another, have been assessed to be in the upper management of military-product research, design, and development) is presented in section II-B. This review does not attempt to define the total scope of these agencies' responsibilities, but rather addresses only the relationship of the agencies with respect to the management of RDTE related to PRC ground forces. (For additional details, see section II and appendixes I and II of reference 4 in bibliography.)

B. STRUCTURE AND FUNCTIONS OF PRC MILITARY R&D MANAGEMENT ORGANIZATIONS

1. (U) (C) The Ministry of National Defense (MND) and People's Liberation Army (PLA)

In addition to the fundamental, formal role of the MND and PLA in the chain of command for the employment/deployment of PRC military forces (fig 4), these agencies have a variety of responsibilities in the development and production of weapons and materiel. Some of these responsibilities are as a functional performer or producer—these aspects are discussed in section VI. Obviously, the MND/PLA exists as the consumer or customer for the PRC defense industrial sector. As such, the military establishment has for many years conducted

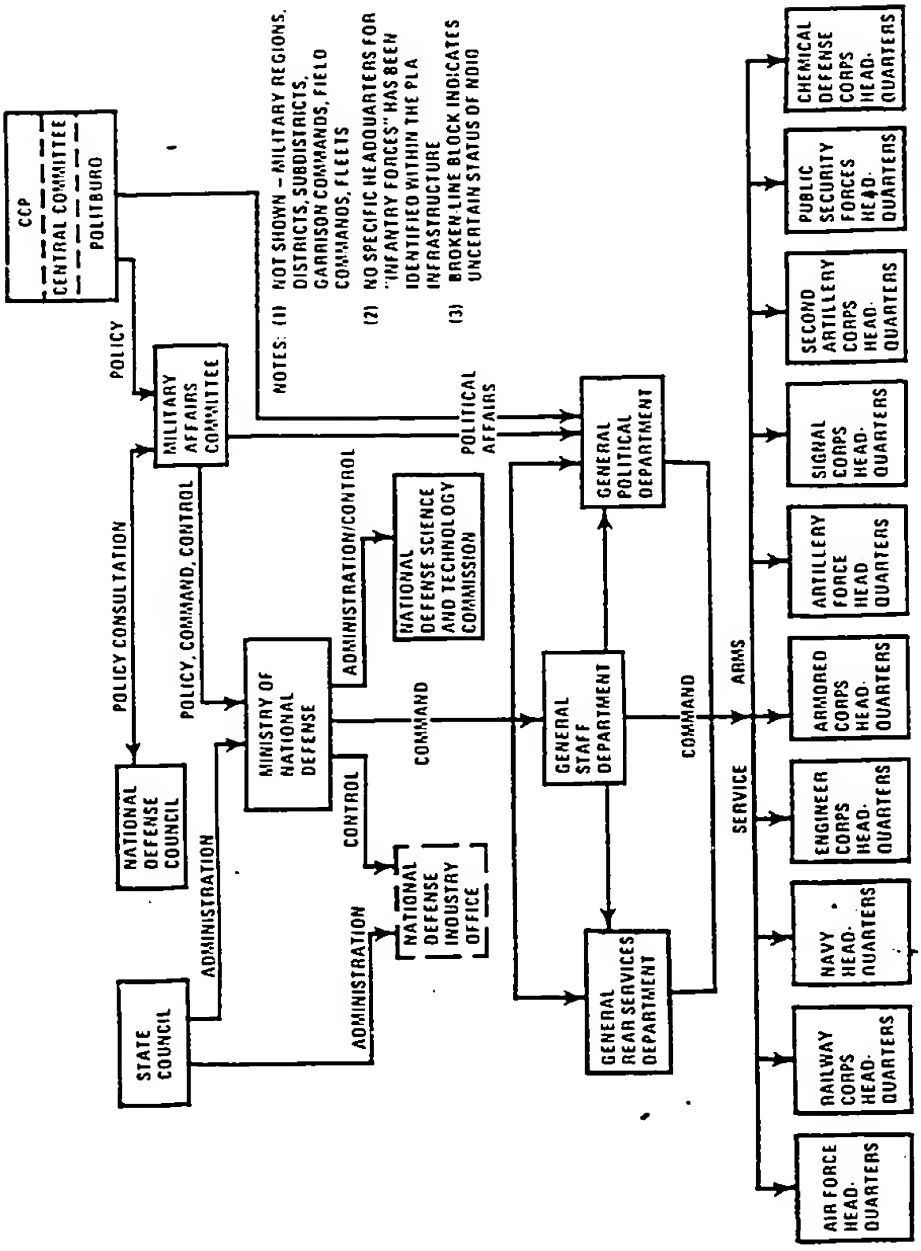

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Figure 4. Command structure of the PRC military establishment (U).

activities consistent with that role. Included among these are: Generating requirements for specific types and quantities of equipment; levying such requirements through channels upon the appropriate industrial sectors and organizations; monitoring, through on-site representatives, the production and quality-control activities of defense plants;* and conducting material acceptance tests. Recently, however, the PRC formal military establishment apparently also has assumed overall control of military-product planning, research, design, development, and production. Although information is lacking concerning the specifics of the interagency dynamics by which such power is implemented, there is little doubt that the MND/PLA holds that authority.

2. (U) The National Defense Science and Technology Commission (NDSTC) of the PLA

It is estimated that, since the early or mid-1960s, the NDSTC, as an arm of the MND/PLA, has been the agency with supreme authority to authorize, coordinate, and control military-product R&D throughout the PRC, in and among both defense and nondefense oriented sectors (fig 5).**

3. (U) The National Defense Industry (NDIO) Staff Office of the State Council

The NDIO may have been established as early as 1960 as a state agency assigned to manage the growing and more specialized PRC defense industrial sector. As the PRC defense industries expanded in the 1960s, the NDIO's influence grew correspondingly, and that growth evidently became one of the focal points in the power struggle referred to earlier. Just as the NDSTC was chartered as the agency responsible for coordination and management of the PRC "national defense science and technology system," the NDIO became the state agency that administered the formally recognized "national defense industry system" (fig 6). The NDIO's responsibilities included not only the administration of defense production but some aspects of the defense R&D effort. Thus, for at least some of the past decade, part of the defense R&D effort was subject to the jurisdiction of both agencies, with the NDIO in an inferior position to that of the NDSTC (a position the NDIO sought to escape). Little has been heard of the NDIO in recent years and, if it is not now defunct, its former powers probably have been significantly downgraded.

*Such on-site monitoring apparently is managed principally, if not entirely, by elements of the PLA General Rear Services Department.

**Available information has characterized the NDSTC as being the apex of a formally identified "national defense science and technology system" in the PRC (fig 5). Indications are that, while the NDSTC is responsible for the development of advanced weapon systems, the same function in the field of conventional weapons is implemented through other mechanisms of the MND/PLA.

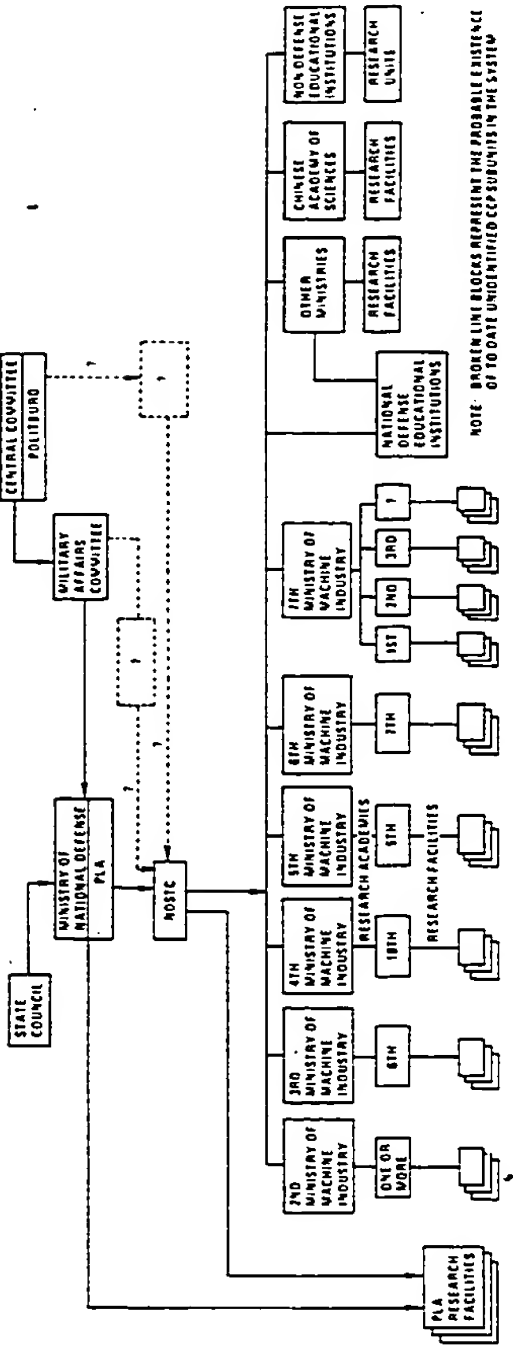

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Figure 5. PRC National Defense Science and Technology System (U).

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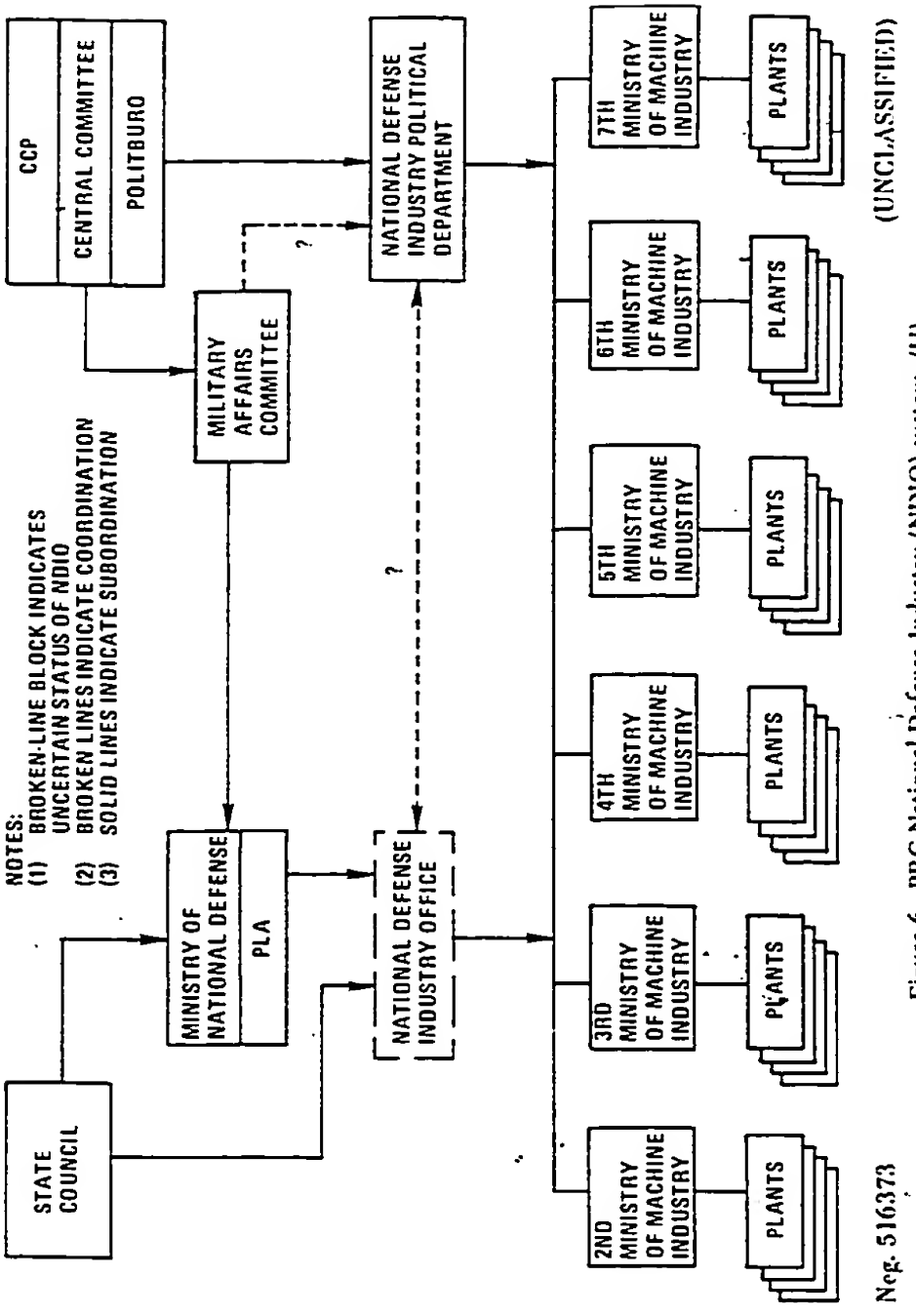

Figure 6. PRC National Defense Industry (NDIO) system (U).

4. (U) PLA "Military Control Committees" During the Cultural Revolution and Their Relationship to Revolutionary Committees

a. As the Cultural Revolution grew more intense at the end of 1966, PRC leaders were faced with the problem of keeping the Red Guards under at least partial control, particularly to contain their disruption of key economic and defense-related agencies vital to the stability and security of the country. This attempt to control the "activists" was only partially successful. The most important defense facilities apparently were adequately protected, and the intrusion into state organs by outside personnel was controlled; however, internal Red Guard factions in nearly all top organizations overturned the leadership (and usually failed to supply a workable substitute). By February 1967, reports from the PRC indicated that many state agencies were being placed under "military control" to insure their continued functioning. This "control" apparently included both the stationing of troops in installations to keep peace and the appointment of "military control committees" to supervise the agencies' operations.

b. Among the organizations known to have come under some form of military control are the defense-related MMIs. The fact that such military control committees were operative in the defense-related MMIs was confirmed by various reports. In particular, a lengthy Red Guard article of October 1968 referred repeatedly to the "Military Control Committee" of the Seventh MMI, and to military control committees of research academies subordinate to that ministry.[5]

c. The military control committees apparently continued to function within various organizations throughout the Cultural Revolution. The proliferation of revolutionary committees (circa 1970 and 1971) resulted in the dissolution of many military control committees, although in some agencies the two committees continued to function harmoniously. The revolutionary committees soon supplanted both the party organization and the administrative apparatus from the national level ministries down to the governing organs of the PRC provinces, counties, and cities.

d. In the aftermath of the Cultural Revolution, the primacy of the party and the party committee system clearly is being reasserted in the PRC at all levels. The effect of this trend is to dilute the power of revolutionary committees generally, and to dissipate the direct (in-house) military influence or control over the operation of organizations. This circumstance in no way is in contradiction to the overriding trend toward the military establishment's domination of the PRC defense R&D and industrial sectors. Rather, that domination is being effected through the external channels of authority described in this study.

5. (U) (S-NOFORN) The PLA General Rear Services Department and the PLA Ordnance Department

a. (U) (C) The General Rear Services (or Logistics) Department (GRSD) heads a widespread network that handles logistic affairs throughout each echelon of the PLA. The overall mission of this department was summarized in a 1966 report, which stated that:

> "It is responsible for logistical planning and the delegation of logistical responsibilities to subordinate commands. It determines the major materiel requirements, manages the military establishment's procurement plan, and is responsible for matters pertaining to the armed forces budget."[6]

b. (U) (S-NOFORN) Lower-echelon rear services departments are located throughout the infrastructure of the PLA military establishment to include: The 13 PRC military regions, the more than 20 military districts, and the various field armies and their divisional and regimental headquarters. These lower-echelon rear services departments apparently are under dual jurisdiction: Each is subordinate both to its immediate military command element (e.g., a field army headquarters, a military district) and to the next higher-echelon rear services department (and, in turn, ultimately to the GRSD).

c. (U) (S-NOFORN) The PLA rear services system also operates networks of schools, production enterprises, supply depots, and hospitals. Although authoritative information is lacking, it appears that these schools are operated primarily by the GRSD's Training Department and by counterpart elements under the major service arms. Production enterprises and supply depots seem to be arrayed under echelons down through the military subdistricts.[7]

d. (U) (C) During 1956 through 1957, the GRSD's Ordnance Department was separated and elevated from the GRSD and existed as the "General Ordnance Department." In 1958, both the military establishment and the industrial sectors were reorganized, and the PLA's Ordnance Department was returned to GRSD jurisdiction. The R&D activities formerly handled by the Ordnance Department were then assigned to the newly established Academy of Military Sciences (AMS).

e. (U) (C) Thus, it appears that, after 1960, major responsibility for production of armaments and munitions was withdrawn from the PLA and isolated in the defense industrial ministries. Indications are that the Ordnance Department's post-1960 mission was one of technical monitoring, arms supply, and logistical support, with no reference to design

or production.[8] The monitoring function was accomplished utilizing a network of "military representatives'" offices at plants "to insure that the quality of production met established standards." While the preceding refers specifically to a network of military representatives at production facilities, it is not unlikely that similar units are resident at military R&D facilities.

f. (U) Thus, although neither extensive nor detailed information is available, it may be postulated that the infrastructure of the General Rear Services Department is the principal mechanism through which the PLA interacts with elements of the defense industrial sector that are responsible for RDTE, as well as production of ground forces weapons, munitions, and related materiel.

6. (U) Other PLA Agencies Interacting With the Defense Industrial Sector

Other internal elements of the PLA judged to be interactive with ground forces RDTE and production enterprises include the General Staff Department (GSD) and several of the service arms, such as the various headquarters for the PLA's Armored Corps, Artillery Forces, Signal Corps, Engineer Corps, and Chemical (Defense) Corps. Only a few staff elements subordinate either to the GSD or to the various service arms have been identified, but a unit for "equipment and logistics" has been reported under the GSD and at least some of the service arms are reported to have staff units for "engineering," "scientific research," and "industry." Additionally, each of the service arms has a Rear Services unit counterpart to the GRSD. The Rear Services elements within the various service arms undoubtedly are simultaneously responsible both to the respective service arms and to the GRSD. A few isolated and random intelligence reports indicate there is significant interaction between elements of the service arms and the defense production plants operating in the respective industrial sectors; the degree of interaction that occurs through units of the Rear Services network and through other subunits of the service arms is unknown.

7. (U) The State Science and Technology Commission

Since its formation in 1958, the State Science and Technology Commission is known to have had broad powers to plan and coordinate national long- and short-range activities throughout the PRC R&D community. At one time, the commission was thought to have similar responsibilities in the area of PRC defense R&D. While this may have been true for a short period, it is now evident that by the early 1960s the NDSTC had assumed those responsibilities. It appears that, in the aftermath of the Cultural Revolution, the Science and Technology Commission may have been abolished and its functions transferred to other agencies. In any case, the commission apparently has had little to do with PRC military-product development.

8. (S-NOFORN) The Academy of Military Sciences (AMS)

a. (S-NOFORN) The AMS was established in March 1958, with Yeh Chien-ying (a marshal of the PLA) as its first and only president. According to one classified report, the Academy was to be "a planning and advisory organ on scientific technology related to the military, as well as an organ to study military science (arts)."[9] Another classified report, compiled in 1964, stated that the Academy has the following mission:[2]

- Research on techniques and methods of employment of modern weapons and equipment received from the USSR.
- Research on rebuilding and imitation of weapons and equipment received from the USSR.
- Research, test, and manufacture of guided missile, rocket, chemical, biological, and nuclear weapons.
- Direction of the PRC armed forces on research and improvement of weapons and equipment.
- Establishment and expansion of research agencies for military science and technology in the PRC armed forces.

b. (S) Information appearing in recent years has forced a reassessment of the Academy's role. As of 1970, no substantial case can be made that the Academy is either a major performer or an overseer of PRC military R&D projects. The Academy's status as a research organization is also suspect since nearly every specific intelligence reference to its research activities dates from 1961 or earlier. One credible assessment of the Academy's present status is that it has been primarily an educational institution for PLA officers and officer candidates. This conclusion, that the Academy provides education in the "military sciences" (military theory, strategy, and operations), is supported by both recent and older references to the facility.

C. OTHER SECTORS INVOLVED IN THE SUPPORT OF PRC GROUND FORCES

9. (U) General

The focus of this report has been on the primary PRC infrastructure supporting the development of ground forces weapons and materiel (that is, the Fifth MMI and related organizations); however, support for PLA ground forces, particularly in terms of the

development and production of materiel other than weapons and munitions, comes from several other sectors in the PRC. The nature of the involvement of such other sectors and organizations is reviewed in the following sections.

10. (U) (S-NOFORN) The PLA

a. (U) Responsibilities of the MND/PLA, both as the customer/consumer for armaments and as an agency in the R&D policymaking and management infrastructure, were discussed in section II-B-2. In addition, the PLA at various echelons supports ground forces both as an R&D performer and as a production agency. The limited information available concerning such activities is not substantial, but is indicative of the scope of these efforts.

b. (S) While the level of R&D activities conducted by the PLA has declined since 1960, some R&D facilities are still known to exist within echelons of the PLA. Few of these facilities have been specifically identified, but PRC news reports have acknowledged the existence of research facilities under the PLA's GSD, GRSD, and the various service arms. Indications are that the R&D activities of such units were not extensive in the past; however, this portion of the overall PRC national defense/military R&D system remains almost entirely unquantified and unevaluated [redacted]

5 USC 552 (b) (1)

c. (S-NOFORN) The PLA also operates a variety of test facilities and proving grounds, including major installations such as the missile test range at Shuang-cheng-tsu [redacted] or the nuclear-weapon test facilities at Lop Nor [redacted] Some of the test installations observed in the vicinity of defense industrial plants may be under the PLA jurisdiction and not formally affiliated with the industrial sector. Some test facilities observed at production plants (e.g., driving tracks, firing butts, and ranges for firing small-caliber weapons) clearly are parts of the plants' facilities. The administrative subordination of installations such as the missile development and test center at Chang-hsin-tien [redacted] is unclear. These facilities may be under industrial ministries, directly attached to the NDSTC, or under some other PLA agency, such as the GRSD.

5 USC 552 (b) (1)

d. (U) (S) Although earlier evidence indicated that the PLA previously had produced armaments and munitions, in addition to other materiel, that activity now appears to be negligible. The PLA's role as an armament producer probably declined between 1949 and 1955 or 1956, then increased between 1956 and 1958, and declined again after 1958 with respect to armaments (but not necessarily with respect to other materiel). Principally through the GRSD, the PLA has continued to operate a variety of production facilities. This

effort is principally restricted to manufacturing spare parts, military clothing, gas masks, consumables (textiles, paper products, and food), rubber products, building materials (e.g., cement and semifinished metal products), and some chemical products.[10,11] Additionally, the GRSD continues to operate storage and distribution depots; parts, maintenance, repair, and overhaul facilities; and test facilities. A few of the depots may be engaged in assembly work or shell loading.

D. SUPPORT FOR GROUND-FORCE R&D FROM ACADEMY OF SCIENCES AND HIGHER EDUCATIONAL INSTITUTIONS

11. (U) (S-NOFORN) Academy of Sciences

a. (U) (S-NOFORN) A 1968 intelligence analysis[12] speculated that approximately 20% of the Academy's research activity is military-related R&D. Although this estimate may be high, some facilities of the Academy (which is subordinate to the State Council) undoubtedly have continued to support PRC military development programs, presumably under the guidance of the NDSTC, possibly through the New Technology Bureau (NTB). The NTB, which reportedly was established in 1958, was created to oversee military R&D projects conducted in Academy facilities.

5 USC 552 (b) (1)

b. (S) Except for a few isolated, dated [redacted] intelligence reports of questionable reliability, no references have been identified to link facilities of the Academy of Sciences either to the Fifth MMI or to research activities directly supporting the development of conventional weapons or munitions. Rather, it appears that the Academy has an indirect relationship to PRC ground-force materiel development. That is, some portion of the "basic" research performed by Academy facilities may be applicable to ground-force weapon requirements but may not have been undertaken explicitly in response to levies from the military establishment. The areas in which the Academy of Sciences is estimated to have provided potential support of defense projects include work on combustion and propellants; materials studies; lubricants research; studies supporting the nuclear program; possible BW/CW studies; research on infrared optics, sonar, radar, electronics, and optical instrumentation; and projects involving semiconductors, computer design, and lasers.

12. (U) (S-NOFORN) Defense-Related Higher Educational Institutions

a. (U) In terms of relationships and contributions to the defense establishment, PRC higher educational institutions can be classified into four broad categories: Advanced schools within the infrastructure of the PLA, including institutions that train officers in a

variety of military skills:* colleges that were organized entirely within the system of a given defense industrial sector and solely devoted to serving the requirements of that sector (e.g., single-course engineering schools such as the Peking Aeronautical College); engineering and polytechnical schools chartered as part of the "civilian" higher educational community but subsequently having been absorbed, de facto, into the "national defense educational system" (e.g., Sian Chiaotung University); and comprehensive and polytechnical institutions that are fundamentally "civilian" but which may contribute R&D resources and specialized technical manpower to the defense establishment (e.g., Tsinghua and Peking Universities). The assessment of the R&D capabilities of these categories of schools, considered in conjunction with the identified trend toward a closed system for defense research, suggests that the total contribution of higher schools to the overall military R&D effort is not nearly as significant as that of the primary defense research facilities.

b. (U) Based upon information that became available during the Cultural Revolution, the first three categories outlined previously are assessed to constitute what has come to be identified as the "national defense educational system," a network of NDSTC-controlled educational facilities that provide technical manpower and some additional R&D resources to the defense effort. Both the existence of such a "system" and its relationship to the NDSTC are well documented. The formal administrative ties between the NDSTC and such schools are unclear (and probably not significant). Some of these institutions were previously subordinate to the Ministry of Higher Education, to various other (industrial) ministries, and to elements of the PLA (such as the Military Training Department of the GSD).

c. (U) ~~NOFORN~~ College-graduate technical personnel probably are supplied to the Fifth MMI from several of the institutions now identified as part of the "national defense education system." These schools are the Peking Industrial College, the Harbin Military Engineering College, the Nanking Artillery Engineering College, and possibly the Nanking Engineering College. All of these have been mentioned in Red Guard literature in defense-related contexts and are not assessed specifically to be supporting any of the other MMIs. The Harbin school and the Nanking Artillery Engineering College may train both PLA personnel and civilian technical/industrial cadres. The frequency with which Red Guard literature has referred to the Peking Industrial College and Nanking Engineering College (and to schools such as the aeronautical engineering colleges) leaves little doubt that

*It is estimated that a few of these schools incorporate technical curricula directed toward developing a body of Army cadre to serve as technical specialists, representatives, or monitors, not only at PLA arsenals and depots but at defense production plants and possibly at military R&D facilities.

they are supplying defense industrial manpower. It is suspected that the Peking Industrial College in particular may have a relationship with the Fifth MMI similar to the Peking Aeronautical Colleges' connection with the Third MMI.

d. ~~(S,NOFORN)~~ Two of the foregoing schools referred to are reported to have engaged in R&D related to ground weapons. An intelligence source stated that the Harbin Military Engineering College investigated the effects of meteorological conditions on artillery. This project is believed to have been led by Chang Fen, the school's specialist in artillery and meteorology.[13] The Peking Industrial College allegedly has performed research and design work for guns and ammunition.

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Section III.

APPARENT PRC DESIGN STRATEGY FOR GROUND-FORCE WEAPONS DEVELOPMENT

1. (U) Introduction

The current PRC developmental strategy for ground-force weapons will be analyzed to facilitate an understanding of the mission of the Fifth MMI (and to specify the primary factor leading to the dualistic approach). Specifically, for a given weapon system, the degree of technological advance sought in weapon development will have a direct impact upon the nature of the RDTE resource bases required and the choice of operating procedures. If the "technology gap" (i.e., the difference between the desired and the existing level of technology) is narrow, the R&D resource requirements are relatively small, and the majority of such R&D can be performed at production plants (i.e., an extensive network of R&D facilities is not required). The actual technology gap and the required resources base reflect the developmental strategy pursued at that time.

2. (U) Detailed Analysis of Current Strategy for Ground-Force Systems Development

a. (U) The type of weapon-developmental strategy adopted by the PRC has varied over time and with differing types of systems. The 10-level scale, shown in figure 7, is presented as a useful abstraction for the analysis of PRC developmental strategies. It depicts the stages or levels of independence through which the PRC has moved (or might be expected to move through) as it achieves increasing independence in the acquisition of weapon systems. The definitions of the levels are self-explanatory; however, the following comments are offered:

- Level 10: No examples of PRC designs at or beyond the state-of-the-art were found.

- Level 9: The basic technology available in the Soviet supplied systems dates back to the 1950s and earlier. Through trade, the PRC is able to obtain, in some areas (e.g., trucks and helicopters), access to more modern technology. Such trade may be in quantities sufficient for direct use or in limited quantities allowing exploitation of the technology.

- Levels 5 and 6: The product improvements shown here are frequently modifications to adapt the Soviet designs to the unique PRC requirements resulting from differing doctrine and geography. For example, the Chinese place greater stress on portability, and many of the design modifications involved weight reduction (even to the extent of sacrificing other characteristics such as range).

Levels \ Systems	Tanks	APC	Mobility Systems	Antitank Weapons	Artillery	Rockets & Launchers	SRBM	Mortars	Infantry	Antiaircraft (AA) Gun Systems	SAM	Radar/Fire Direction	Tact. Comm.	CAV	Helicopters	Engineer Equip.	Ammo
10. Advanced native design and production																	
9. Acquisition of modern systems/subsystems by trade			10,11, 12												2,3		
8. Exploitation of more recently acquired US or USSR equipment, e.g., Vietnamese War	4 (poss)										2 (poss)						
7. Original native design and production, behind state-of-the-art		1				3,4			1				1,2				
6. PRC production of copies, with major product improvement	1			1,2	5				2			4					
5. PRC production of copies, with minor product improvement	2						1	1		6,7, 8	1	3		1			
4. PRC production of copies of Soviet equipment	3		1,2,3 4,5,6 7,8,9		1,2 3,4	1,2		2	3	1,2,3 4,5		1,2	3	2,3 4	1	2,3	1,2 3,4 5
3. Use of Soviet-supplied equipment																	
2. Improvement/copy of captured (WW II & Korea) equipment				3	6			3									
1. Use of captured equipment																	

Note: See text section III-2 for explanation of numerical entries.

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Figure 7. PRC ground-force systems vs. levels of independence (U).

b. (U) For specific ground-force systems, the current development strategy in relation to this scale is shown in figure 7. The list of systems is not all inclusive. Rather, it is limited to major systems now being produced or imported that reveal the PRC technological capability for that system category. The explanation of the numerical entries in figure 7 is continued in table I.

Table I. Design Strategy for Ground Force Systems (U)

Systems	Comments			
Tanks	1.* The Type 60/63 light amphibious tank is a product improved version of the Soviet PT-76, incorporating a larger engine, larger gun, and a welded turret of native design. (level 6)	2. The Type 62 light tank is a scaled-down (lighter-weight and smaller-gun) version of the Soviet T-54A. (level 5)	3. The Type 59 medium tank (the PRC main battle tank) is a close copy of the Soviet T-54A.	4. Chinese exploitation of a captured Soviet T-62 could result in an improved medium tank, incorporating such features as a larger, smoothbore gun, increased horsepower, and infrared night sighting devices. (level 8)
Armored personnel carrier (APC)	The M-1967 APC appears to be a bonafide native design based on relatively mature technology; i.e., it incorporates no technological advances. (Level 7)			
Mobility systems	1. The Model 59 artillery tractor is a copy of the Soviet ATS-59.	2. BJ-212, 4x4 1/2-ton jeep, is a copy based on the following Soviet jeeps: The GAZ/UAZ-69, the UAZ-460 (experimental), the UAZ-469, and the UAZ-469B.	3. NJ-230, 4x4 1 1/2-ton General Service (GS) truck, is a copy of the Soviet GAZ-63.	4. NJ-130, 4x2 2 1/2-ton GS truck, is a copy of the Soviet GAZ-51 with minor changes.
	5. CA-10, 4x2 4-ton GS truck, is a copy of the Soviet ZIL-150.	6. CA-30, 6x6 4-ton GS truck, is a copy of the Soviet ZIL-157.	7. JN-150, 4x2 8-ton GS tipper truck, is a copy of Czechoslovak Skoda 706 RT.	8. XD-250, 6x6 10-ton cargo truck, is a copy of Czechoslovak TATRA-111, which was produced in Czechoslovakia 1952 to 1961.
	9. XD-160, 6x6 12-ton cargo truck, is a copy of Czechoslovak TATRA-138, which superseded the TATRA-111 in 1961 and was in turn replaced by the TATRA-148 in 1970.	10. Japan is the largest supplier of trucks to the PRC. Examples are the 4-ton and 7-ton cargo trucks. (Level 9)	11. Romania is the second largest supplier of trucks, such as the BUCEGI cargo truck. (level 9)	12. France is also supplying many trucks, such as the Berliet, 6x6 4-ton cross-country truck. (level 9)
Antitank weapons	1. The Type 65, 82-mm recoilless gun, is a modified copy of The Soviet B-10. The weight has been reduced to less than one-third that of the B-10; indicating improving PRC weapon technology and ingenious use of materials. (level 6)	2. The Type 69, 40-mm antitank grenade launcher, is an improved version of the Soviet RPG-7. Significant weight reduction has been achieved, and improved performance is provided by a better sight that minimizes the fire control problems of the RPG-7. (Level 6)	3. The Type 36, 57-mm recoilless gun, is a copy of the US M18A1. (level 2)	

*Numbers correspond to the column entries in figure 7. The level for the system is level 4 unless otherwise indicated.

Table I. Design Strategy for Ground Force Systems (U) (Continued)

Systems	Comments			
Artillery	1. The Type 56, 85-mm field gun, is a copy of the Soviet D-44.	2. The Type 54, 122-mm howitzer, is a copy of the Soviet M-1938.	3. The Type 60, 122-mm field gun, is a copy of the Soviet D-74.	4. The Type 66, 152-mm gun howitzer, is a copy of the Soviet D-20.
	5. The Type 59-1, 130-mm field gun, is an ingenious design adaptation incorporating the best features of two Soviet artillery pieces (the Soviet M-46 130-mm field gun tube mounted on the lighter gun carriage of the D-74 122-mm field gun). (Level 6)	6. The PRC 70-mm howitzer is a copy of World War II Japanese Model 92 70-mm lightweight howitzer (211 kg). (Level 2)		
Rockets & launchers	1. The 132-mm (16-round) rocket launcher is a copy of the Soviet BM-13.	2. The 140-mm (16-round) rocket launcher is a copy of the Soviet BM-14-16.	3. The Type 63, 107-mm rocket launcher, is a native design (utilizing a scaled-down version of the Soviet 140-mm rocket round). (Level 7)	4. The Type 63-1, 107-mm rocket launcher, is a lightweight version of the PRC-designed Type 63 and represents some surprisingly good R&D effort (ingenious use of materials and modular construction techniques). (Level 7)
Short-Range ballistic missile (SRBM)	The PRC SRBM is probably very similar to the Soviet SS-2 Sibling and is postulated to have been improved by addition of an inertial guidance system. (Level 5)			
Mortars	1. The Type 53, 120-mm mortar, is probably a product-improved (lighter-weight) copy of the Soviet M-1943. (Level 5)	2. The Type 53, 82-mm mortar, is a copy of the Soviet M-1937.	3. The Type 63, 60-mm mortar, is a product-improved (lightweight) copy of the US M-2. (Level 2)	
Infantry	1. The Type 64, silenced submachinegun, first produced in 1964, was of indigenous design but reflected crude production techniques. (Level 7)	2. The Type 68, 7.62-mm carbine, combined features of the Soviet SKS and AK-47 and Czechoslovak weapons; however, it demonstrates excellent production techniques. The Type 68 receiver is the world's simplest and cheapest rifle receiver, and the weapon has been found to be highly effective and reliable. (Level 6)	3. The Type 67, general-purpose machinegun, is a system adapted from several Soviet and Czechoslovak weapons, reflecting little innovative design and relatively crude production technology.	

Table 1. Design Strategy for Ground Force Systems (U) (Continued)

Systems	Comments			
Antiaircraft (AA) gun systems	1. The Chinese, since about 1956, have been producing copies of the Soviet 14.5-mm ZPU-2 twin-mount, towed heavy machinegun. For antiaircraft fire control, the system uses a Chinese modification of the optical computing sight from the Soviet ZU-23 AA gun. The system has a dual role against air and ground targets.	2. The Chinese, since about 1956, have been producing copies of the Soviet 14.5-mm ZPU-4 quadruple-mount, towed, heavy machinegun. The system has a secondary role against ground targets.	3. The Type 55, 37-mm towed AA gun, is a copy of the Soviet M-1939.	4. The Type 59, 85-mm towed AA gun, is a copy of the Soviet KS-12.
	5. The Type 59, 100-mm AA gun, is a copy of the Soviet KS-19.	6. The Type 59, 57-mm towed AA gun, is a modified copy (improved sighting capability) of the Soviet S-60. (Level 5)	7. The Type 65, 37-mm twin-mount, towed AA gun utilizes two standard Soviet M-1939-type gun tubes mounted on a heavier carriage of PRC design. (Level 5)	8. The Type 63, 37-mm twin-mount, self-propelled gun features an open armored turret mounted on a T-34 tank chassis. (Level 5)
Surface-to-air missiles (SAM)	1. The CSA-1 is a copy of the Soviet SA-2.	2. A simple heat-seeking SAM could be developed soon based on exploitation of the US REDEYE or the Soviet SA-7. (Level 8)		
Radar/fire direction	1. The Chinese are probably producing their version of the Soviet PUAZO-6 electromechanical fire control director for use with the 57-, 85-, or the 100-mm AA guns.	2. The PRC-produced version of the Soviet FIRE CAN radar is used in conjunction with three variations of the PUAZO-6 fire control director and the D-49 rangefinder, to direct the fire of six to eight 57-, 85-, or 100-mm guns.	3. The PRC GIN SLING radar (used with the CSA-1 SAM system) is a modified [improved electronic countermeasure (ECM) capability] copy of the Soviet FAN SONG. (Level 5)	4. The PRC TEAM WORK is a new fire control radar (used in conjunction with both the FIRE CAN, associated with the 57-mm guns, and the GIN SLING, employed with the CSA-1). TEAM WORK is probably a significant improvement of the older FIRE CAN. Important features of TEAM WORK are frequency agility, pulse repetition frequency (PRF) agility, and multifrequency operation. The introduction of multifrequency operation represents a significant advance in PRC fire control radars, as compared with Soviet systems. (Level 6)

Table 1. Design Strategy for Ground Force Systems (U) (Continued)

Systems	Comments			
Tactical communications systems	1. The MERCURY TALK AM-CW, 2-W manpack radio, is a fully transistorized radio of PRC design, providing communications at battalion and regimental levels. The MERCURY TALK replaces the Chinese Type 63 radio, which was of PRC design and was produced in 1965 (with the Type 62, also of PRC design). (Level 7)	2. The MERCURY WALK FM, 1-W manpack radio, is a solid state FM radio, which replaces the Type 62 and is used at platoon and battalion levels. (Level 7)	3. The CX-2 field telephone is a copy of the Soviet TAI-43.	
Chemical-biological warfare	1. The PRC utilizes a CW individual decontamination kit similar to the Soviet IPP individual decontamination kit. The novel PRC addition of prophylaxis pills indicate independent research in this area. (Level 5)	2. The standard PRC protective mask is a copy of the Soviet SHM-1 mask.	3. The PRC has probably reproduced limited quantities of the Soviet truck-mounted decontamination equipment, ADM-48, ARS-12, and DDA-53.	4. The PRC Type 58, flamethrower, is a modified version of the Soviet LPO-50. The PRC also has an improved lightweight pressure-testing kit.
Helicopters	1. The PRC Whirlwind 25 is a copy of the Soviet MI-4 (HOUND) general-purpose helicopter. (Experimental modifications have been reported; e.g., substitution of turbine engine for original piston engine.)	2. The PRC imported the French Alouette III in 1967. (Level 9)	3. The French-designed Super Frelon (SA-321) heavy helicopter has been imported recently. (Level 9)	
Engineer equipment	1. The PRC is probably producing limited numbers of the Soviet TPP heavy ponton bridge.	2. The PRC is probably producing limited numbers of the Soviet N2P-45 steel ponton bridge.	3. The PRC is probably producing limited numbers (or using Soviet supplied systems) of the Soviet multispan KMM bridge.	
Ammunition	1. Antitank ammunition is based primarily on copies of Soviet ammunition, with minor modifications.	2-4. Tank rounds, artillery small arms--same as antitank.	5. PRC fuzes are mostly copies of Soviet or World War II-type Japanese fuzes.	

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3. (U) Summary of Current Design Strategy and Resource Implications

a. (U) The total number of system areas listed against different levels of design independence (fig 7) are as follows:

- Level 2: 3 systems.
- Level 4: 38 systems.
- Level 5: 9 systems.
- Level 6: 6 systems.
- Level 7: 6 systems.
- Level 8: 2 possible systems.
- Level 9: 5 examples of imported systems.

PRC ground-force weapon development/production emphasis is still on the production of copies of Soviet systems; however, a significant capability has been developed for incorporating product modification or creating native designs.

b. (U) Examination of figure 7 and explanatory comments in section III-2 further reveal that ground-force R&D has been concentrated in the following areas:

- Tanks (adaptive combination of components from several Soviet systems and some indigenous improvements) (fig 8).
- APC (simple but practical native design using at least one Soviet component—the PT-76 light-tank engine) (fig 9).
- Antitank weapons (ingenious use of materials and design changes to reduce weight, plus improved sighting) (fig 10).
- Artillery (clever combination of Soviet components and PRC design modifications to produce an effective lightweight weapon) (fig 11).
- Rockets and launchers (ingenious use of materials and design to achieve lightweight, man-portable, modular rocket system) (fig 12).
- Infantry (excellent design for Type 68 carbine, adapting components from several Soviet small arms and incorporating outstanding design for efficiency of production) (fig 13).
- Tactical radios (native design, based on solid state devices to obtain light, reliable radios) (fig 14).

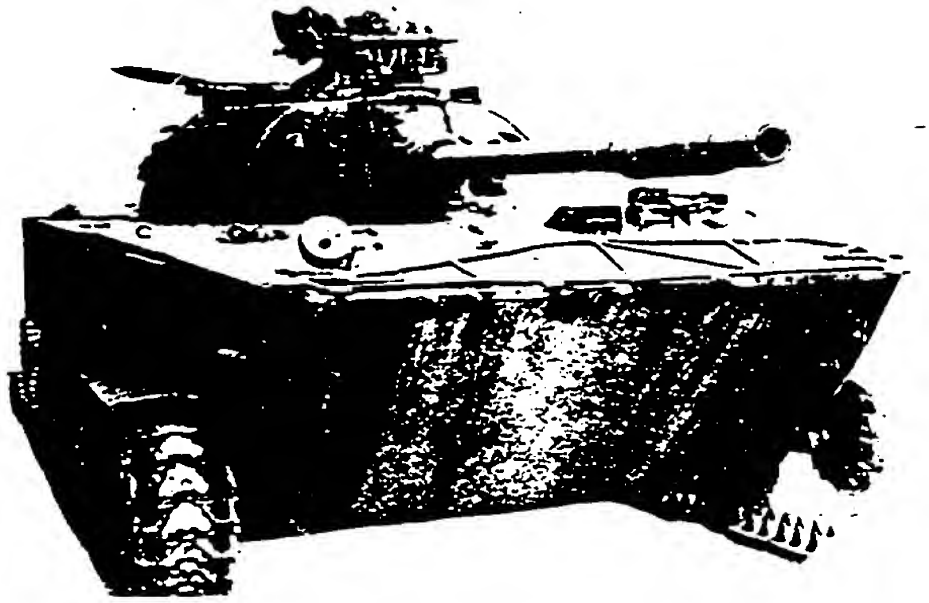

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Figure 8. Type 60/63 amphibious and Type 62 light tanks (U).

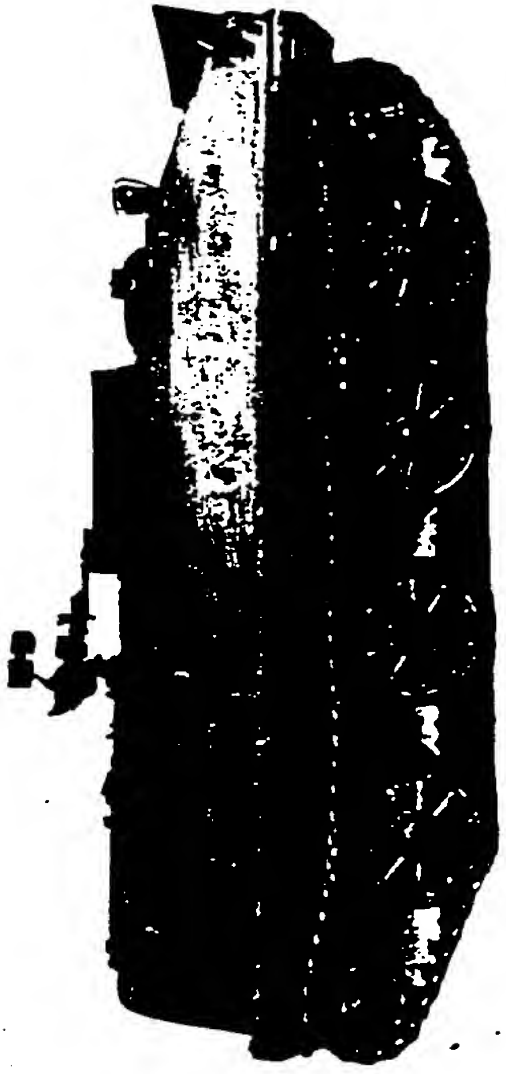

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Figure 9. M-1967 armored personnel carrier (U).

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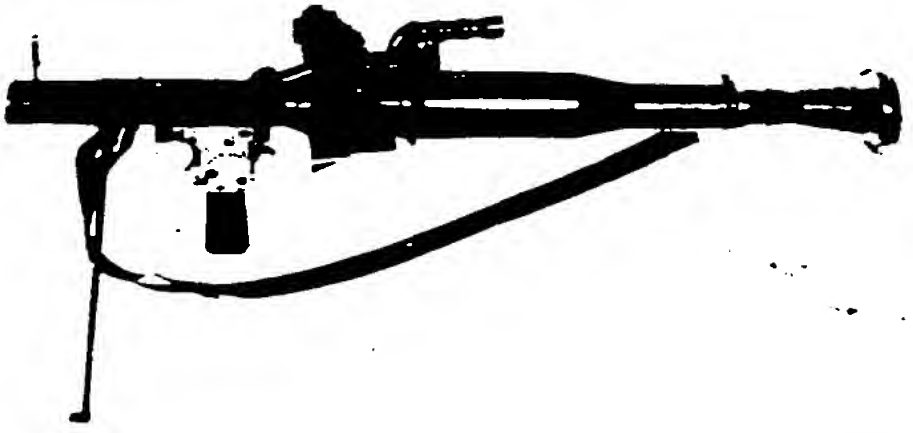

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Figure 10. Type 65 (82-mm recoilless gun) and Type 69 (40-mm antitank grenade launcher) (U).

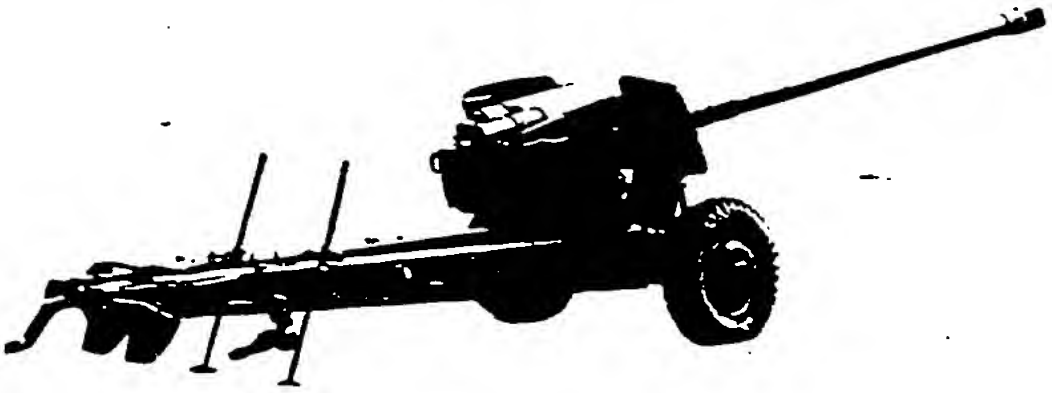

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Figure 11. Type 59-1, 130-mm field gun (U).

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Figure 12. Type 63-1, 107-mm rocket launcher (U).

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Figure 13. Type 68, 7.62-mm carbine (U).

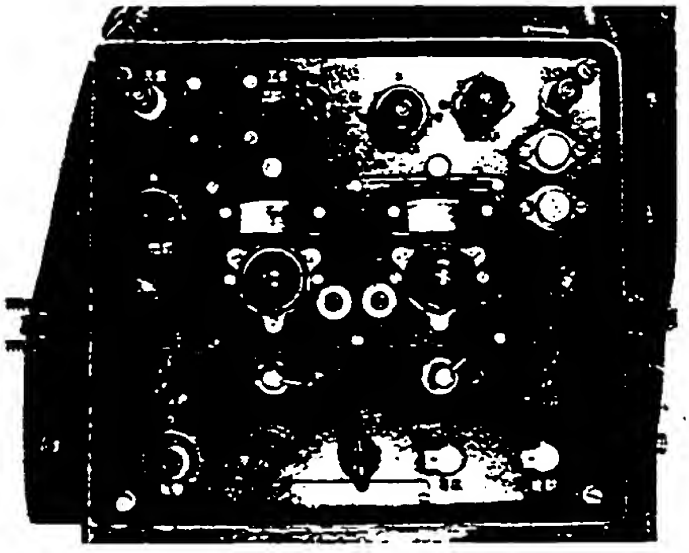

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Figure 14. MERCURY TALK (radio) transceiver (U).

c. (U) The design strategy described here is compatible with the facilities' descriptions provided in section V, and both (design strategy and facilities description) are in agreement with the agrument that PRC ground-force weapon R&D has been performed in a manner different from that of "advanced systems."

d. (U) The analysis of PRC systems versus levels of design independence has been used to establish the overall pattern for ground-force weapon design strategy for the present (or recent past). In section VI, it will be suggested that the same conceptual framework can be useful to evaluate possible future design strategies and establish R&D resources indicators that might provide advance notice of changes in such strategies.

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Section IV.

ORGANIZATION OF THE FIFTH MINISTRY OF MACHINE INDUSTRY

A. GENERAL STRUCTURE AND OPERATION

1. (U) Organizational Structure

Although the Fifth MMI is known to have been established to direct the development and production of weapons, munitions, and related materiel for PRC ground forces, virtually nothing has been reported regarding either the Ministry's bureaucratic infrastructure or its subordinate production and R&D establishments. Therefore, within the present discussion, estimates of the nature of the Fifth MMI's infrastructure, the various facilities subordinate to the Ministry, and the jurisdictional distribution of those facilities are largely inferential. Figure 15 depicts the estimated internal bureaucracy of the Fifth MMI. The figure is a synthesis of information concerning the bureaucracies of many PRC industrial ministries, but the representation is considered reliable; there is ample evidence that, allowing for basic differences in the missions of such agencies, all PRC industrial ministries are similarly structured.*

2. (U) Leadership of the Ministry

a. As of mid-1966 the leadership of the Fifth MMI reportedly included the Minister and six Deputy Ministers. The "Proclamation of the National People's Congress of the People's Republic of China,"[15] issued in January 1975, designates Li Cheng-fong as the present Minister of the Fifth MMI.

b. There appears to be a fundamental and important difference, in terms of professional orientation, between the minister and his deputies. In the PRC system, a minister is oftentimes an "outside man." That is, he did not become Minister by advancing through management ranks within the Ministry, but moved into the Ministry from a command position in the PLA. He represents the Ministry's interests in the State Council and in high party circles, and could be thought of as its political leader and "lobby" at higher policymaking levels as opposed to a production manager. The appointment of former PLA Commanders to ministerial positions is one way of insuring continued party control of key industries.

*The extent to which plans for streamlining the internal bureaucracies of state agencies, called for during the Cultural Revolution, may have been implemented and the effect of such implementation on ministerial infrastructures are not yet known.

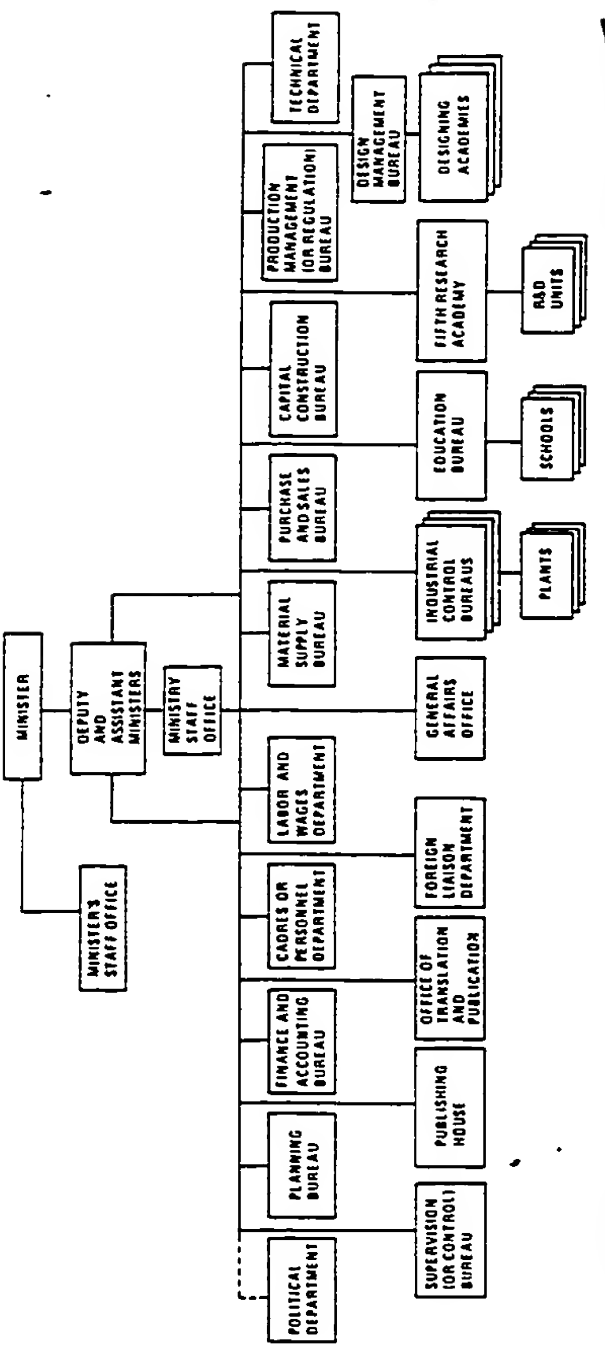

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Figure 15. Estimated organization of the Fifth Ministry of Machine Industry (U).[4]

c. Thus, the "working management" of the Fifth MMI is thought to be in the hands of the deputy ministers, who are part of a large force of professional administrators in the PRC who specialize in bureaucratic management on a career basis. Most of the deputies head the various control bureaus, and are responsible for the activities of the Ministry's several subsectors.

3. (S-NOFORN) Control Bureaus and Subordinate Production Plants

a. The scope of responsibility for production activities in PRC ministries is known to be divided into specific sectors according to product type. These sectors are managed by individual control bureaus (chu), structured at the first bureaucratic echelon below the Ministry leadership. Figure 16 depicts the estimated organization of a typical industrial control bureau under a PRC industrial ministry. Comparison of figure 16 with figure 15 indicates that the structure of a control bureau is almost a mirror image of the Ministry's infrastructure.

b. (S-NOFORN) Given the realization that the PRC defense industrial organization was modeled after that of the USSR, it is estimated that the Fifth MMI includes at least five major production control bureaus (similar to the five separate main administrations of Ministry of Defense Industry for ground forces weapons and materiel that existed in the Soviet Union during the 1950s). The areas of responsibility for the bureaus are believed to be: Ammunition, explosive munitions, and explosives; small arms, including crew-served weapons; artillery, mortars, and rockets; armored vehicles; and optical instruments and equipment.

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c. Although many PRC weapons and munitions plants have been identified, very few have been reported in terms of their organizational jurisdictions. [redacted] Manipulation of information derived from marking analysis, various intelligence reports and summaries, and limited open-literature sources supports an estimate that the jurisdiction of the Fifth MMI may include at least 53 production plants. In terms of product responsibility, these plants are distributed as follows:

- Ammunition, explosive munitions, and explosives—30 plants.
- Small arms and crew-served weapons—8 plants.
- Artillery, mortars, and rockets—5 plants.
- Armored vehicles and engines—6 plants.
- Optical equipment—4 plants.

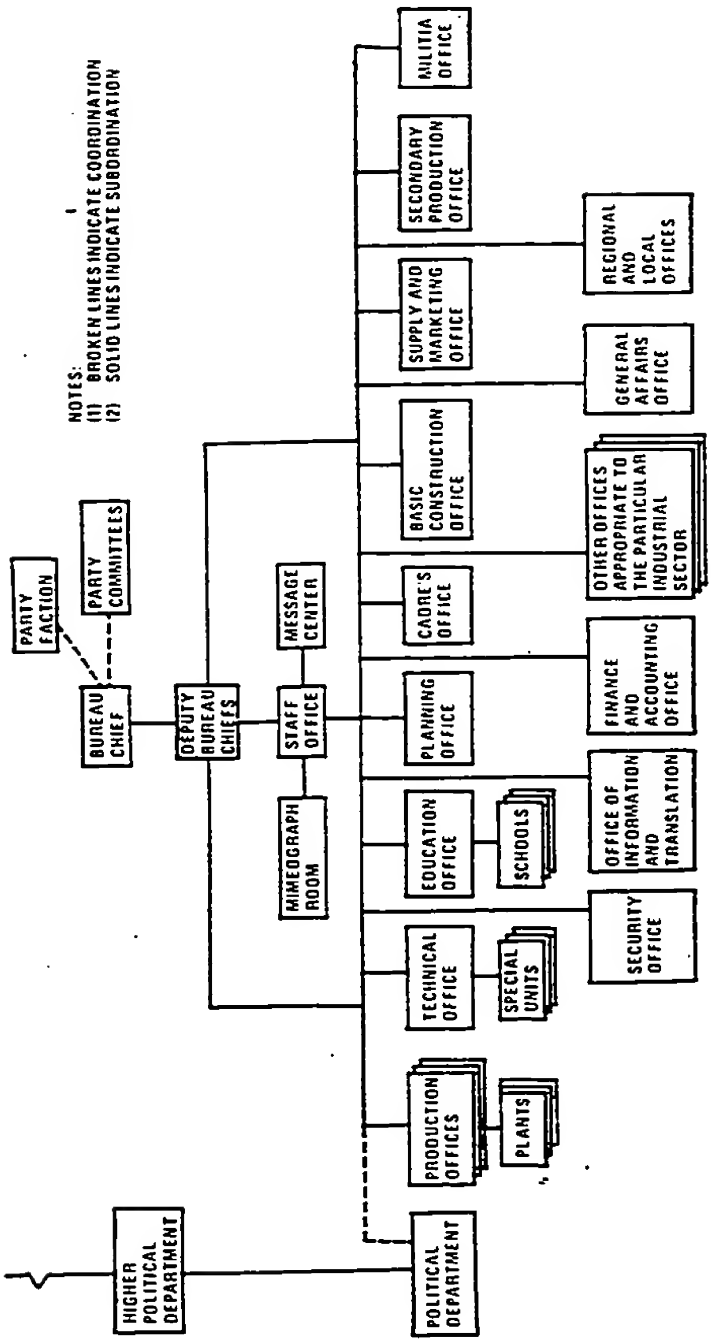

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Figure 16. Estimated organization of a control bureau in an industrial ministry (U).

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4. (S-NOFORN) Educational Units Within the Fifth MMI

a. (C) At one time, the defense industrial ministries apparently had at least partial jurisdiction over certain higher schools, usually single-course engineering colleges directly supporting the ministries' product sectors; in recent years, however, such higher schools reportedly have come under other jurisdictions, although they may continue to support the same industrial sectors.

b. (S-NOFORN) Probably, as in other ministries, the Fifth MMI's Education Bureau and counterpart education offices within the control bureaus operate some secondary industrial and technical schools to supply manpower to the Ministry's plants and offices; however, the educational system serving the Fifth MMI is not well defined. Various intelligence reports have referred to several "schools" related to ground weapons.[16] Included among these were: An ordnance repair and engineering school in Shenyong, a munitions cadres school in Sian, a tank school in Peking, and artillery schools at various locations. It is not possible to determine how many of these facilities are in the Fifth MMI system and which are PLA service schools providing branch training, but most appear to be in the latter category.

5. (C) Designing Academies

5 USC 552 (b) (1)

Most PRC ministries customarily have one or more she-chi-yuan ("designing academies") responsible for overall design of new industrial plants, including the selection and layout of equipment. Most designing academies were the outgrowth of former ministry designing offices or bureaus. [redacted]

B. MINISTERIAL RDTE ELEMENTS/RESOURCES/FACILITIES

6. (C) Types of RDTE Elements

In the Fifth MMI, as in other ministries, resources or units for R&D, product design, engineering, testing, and other technical activities can be thought of as existing in three categories: (1) Among units within the internal bureaucracy of the Ministry (i.e., technical

departments and control bureaus); (2) in external, subordinate R&D institutions (i.e., research institutes subordinate to ministerial research academies); and (3) with the production enterprises. As noted earlier, nothing specific is known with respect to any Fifth MMI units in the first category, but a theoretical organizational structure was developed based on that of other known ministerial organizations. Three possible facilities in category two, as well as the rationale for the existence of category three facilities, are also discussed in the following sections.

7. (U) Technical Departments

Apparently, most or all PRC ministries include as a first-echelon bureaucratic unit a Technical (or Technology) Department* that has a variety of responsibilities related to ministry-wide R&D. These responsibilities have been estimated to include:

- Collecting and processing a variety of technical information, material, and "exerpience" relevant to the ministry's industrial sector from all elements within the ministry and from appropriate outside sources.

- Disseminating technical standards, information sheets, technical circulars, instructions, guidelines, instructional materials, and other "official" documentation.

- Planning, organizing, and conducting scientific and technical conferences and seminars.

- Publishing under its name technical articles and monographs and acting as a publishing agent for technical authors within the Ministry.

- Providing technical expertise to assist in solving specific technical problems throughout the subdivisions of the ministry.

At least one PRC ministry's technical department included a "Scientific Research Division" of unknown scope.** Other specific subunits identified in one or more technical departments include a standardization section, a technical information section, and a technical innovation section.

*The distinction between "Technical (chi-shu) and "Technology" (kung-i) Department is unclear. Within the organizations of production plants, reference to a unit as the "technical" section appears to indicate that both technological and design functions are combined within the unit.

**The Ministry of Petroleum Industry.

8. (U) (C-NOFORN) Technology/Technical Offices in Control Bureaus

a. There are references to both technology (technological) offices (kung-i ch'u) and technical offices (chi-shuch'u) under control bureaus, although only one report has identified both under the same bureau.[17] As was noted earlier, the functional distinction between the two units is unclear and, again, neither has been identified specifically within the Fifth MMI. According to information concerning other PRC industrial ministries, the technical office is one of the most important units of the control bureau. The office interacts with its ministry-level counterpart and appears to share many of the latter unit's responsibilities. Both technical departments and technical offices deal directly with production plants. The technical office directs its communications to the plant's chief engineer, the individual in charge of the research, experimental design, trial manufacturing, and testing activities at the plant.

b. The limited information available suggests that the technical offices are organized (or tailored) to meet the specific needs of the respective industrial sectors assigned to the control bureaus. Thus, identifying a typical structure for such an office may not be possible, because the subdivisions of one technical office could differ considerably from those of another. In addition to their function of providing information, the technical offices are also believed to be involved in the areas of establishing standards (both measurement and design) and in the criteria for technical acceptance inspections utilized within the parent ministry. The technical information activities of the control bureau, through such subdivisions as the technical information office, library, and data room, parallel those of the parent ministry.

9. (U) Involvement of Control Bureaus in R&D

At least in some PRC ministries, the involvement of control bureaus in research and development and in product design and testing apparently takes three general forms. The control bureaus:

- Interact with the major research academies and institutes of the ministry.
- May operate some smaller specialized R&D "offices" or "laboratories."
- Assign projects to the research, design, and experimental units of the production plants under the control bureaus.

There is no evidence, however, to support the view that these control bureaus have extensive R&D networks; the R&D units organic to the bureaus have, at best, only limited resources for research work. The technical office of a bureau probably is responsible for whatever in-house R&D exists. Virtually all control bureau-related R&D is performed by the R&D elements within production plants (see the discussion in section V, subsection C).

10. (U) Ministerial Research Academies and Institutes

a. Almost all PRC ministries have one or more subordinate "research academies" (Yen-chiu-yan), and usually also second-echelon "research institutes" (Yen-chiu-so). Lower-level research facilities also may exist in these hierarchies. Within (and only within) the defense industrial sector, such academies and institutes are identified by number. A major issue in the power struggle referred to earlier concerned whether this network of numbered academies and institutes was to remain under MMI jurisdiction or was to be controlled by the NDSTC. Short-term shifts in de facto jurisdiction or control notwithstanding, these numbered facilities apparently remained subordinate to the defense industrial MMIs, although several are known to be closely involved with the NDSTC.

b. With the exception of the Seventh MMI, which has at least four subordinate research academies, no defense industrial ministry has been discovered to have more than a single research academy. Under the Fifth MMI, a Fifth Research Academy has been identified, but no specific information concerning its activities has been reported. Although its exact location is unknown, it might be in Sian, where there is a concentration of important weapon and munition plants. The Fifth Academy reportedly has a subordinate Seventh Research Institute in Shen-yang, but nothing is known of its activities. Additionally, an intelligence source referred to a research institute of the pre-1963 Third MMI, thought to be located in Peking and conducting research "on artillery shells and explosives such as TNT."[18]

c. Thus, the existence of a single research academy and perhaps two other research facilities of the Fifth MMI have been reported, by name only. This is in sharp contrast to the relatively extensive networks of R&D facilities identified under both the Fourth and the Seventh MMIs. This circumstance indicates not only that the PRC R&D base for ground-force weapons and materiel is comparatively small but that that R&D base may be principally concentrated and oriented in and around the Fifth MMI's production enterprises. On the basis of this postulation, the following section of this report examines R&D activities at PRC production plants, including several plants estimated to be subordinate to the Fifth MMI.

C. RDTE AT PRODUCTION PLANTS

11. (U) RDTE Performance at Production Plants

a. Considering that the level of effort in Chinese ground-weapon development has been modest (although increasing), that, there appears to be no large institutional R&D base, and that design-copying has been the principal access to new weapons in the PRC, there is reason to postulate that the R&D base for conventional ground weapons and materiel is concentrated in or near the production facilities. By virtue of this close association, the R&D elements are very much attuned to the production technology and engineering problems of a given plant, which should result in considerably reduced lead times for the production of any given end item.

b. There is much evidence that PRC plants do have and have had a role in RDTE. In the last several years in particular, the Chinese official press has referred repeatedly to the achievements of plants in research, "technical innovation," and the development and "trial production" of new products and processes. Typical of the many official pronouncements on the subject of research at plants was a journal article that reviewed the 1966 scientific research plan for light industry.[19] One of the plan's points was to "organize factories to conduct scientific research." Further, post-Cultural Revolution doctrine also calls anew for the "integration" of scientific research with production. This is not a new position. For both ideological and pragmatic reasons, the Chinese regularly have emphasized the desirability of "relating" scientific research to production.

12. (U) (C) The Organizational Elements for Plant Research, Design, and Development

a. (U) Plants in the PRC, like ministries, ministry-control bureaus, and other bureaucratic units, are structured similarly from sector to sector. The dissimilarities noted among various bureaucratic enterprises are attributable principally to industrial or economic factors peculiar to given sectors. While in some instances these dissimilarities are not insignificant, they seem to have a greater impact upon operational practices than upon organizational structures. Thus, the unique aspects of a particular industrial sector are likely to have relatively less impact on the nominal structure for R&D work at production plants, and more impact on the nature and extent of such activities at the production level. Therefore, while the units discussed below do not necessarily occur or function as described within all PRC production enterprises, they are typical of most of these operations.

b. (U) (C) Figures 17 and 18 depict the organizational structures of production enterprises under two different sectors of the PRC machine-building industry. With respect both to overall plant structure and the arrangement for RDTE, the figures effectively illustrate the similarities and differences in the organization of such facilities.

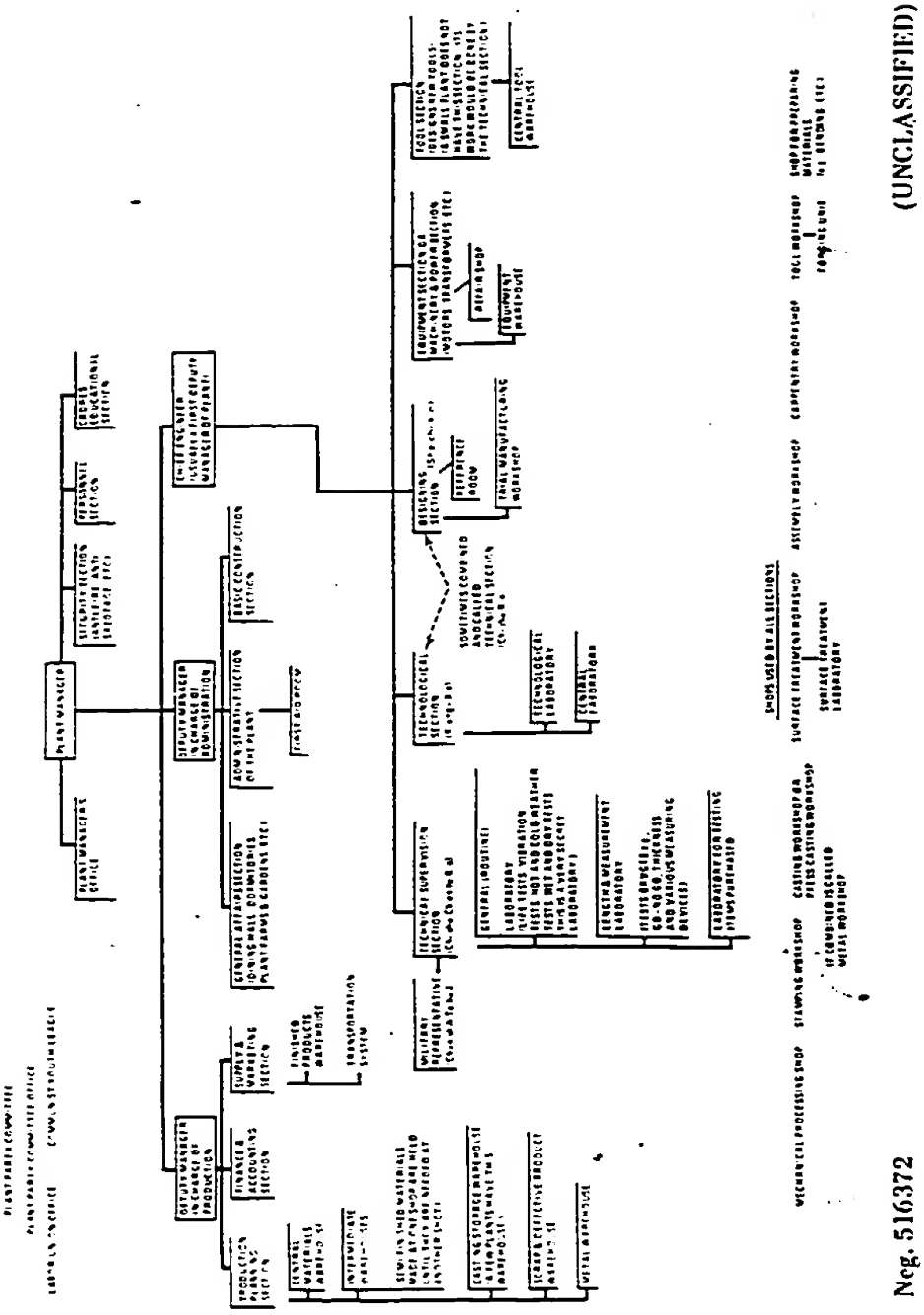

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Figure 17. Organization of a typical electronic plant (U).[20]

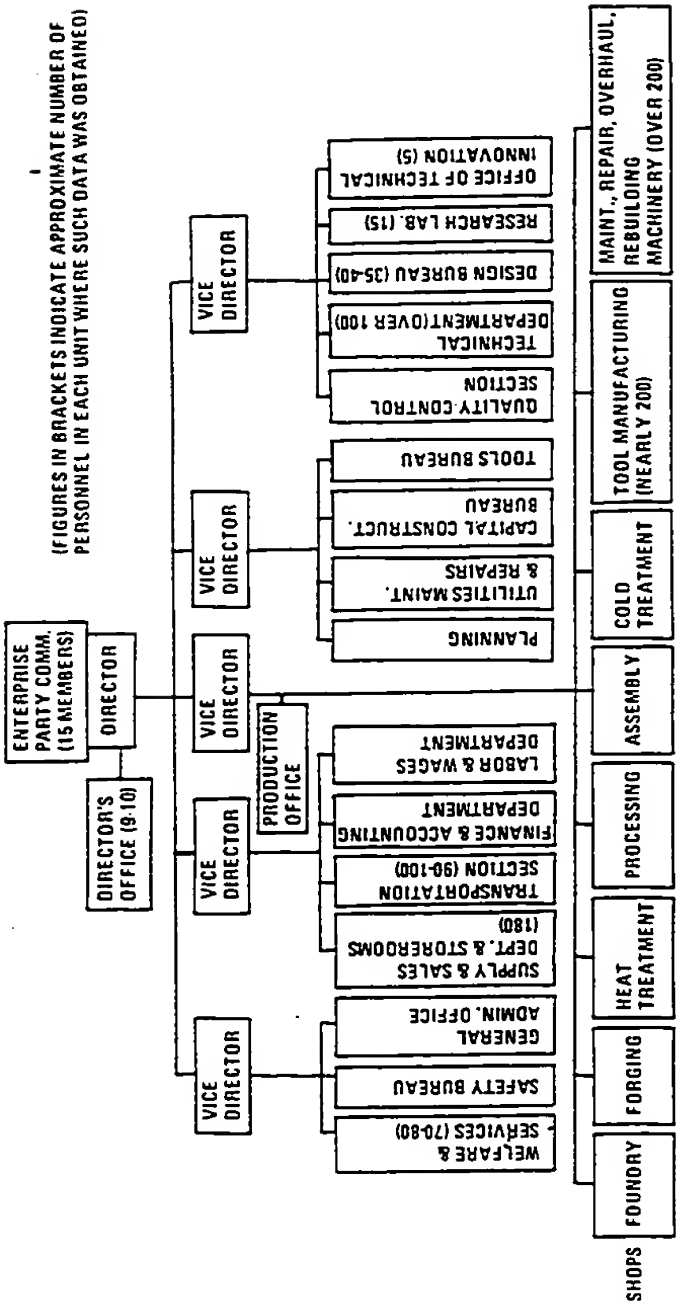

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Figure 18. Organization of the Wu-hsi Diesel Engine Plant (U).[21]

13. (U) Plant Collaboration With Other Agencies

The collaboration on a research project, among officials at a plant, a higher educational institution, and a research facility is not uncommon in the PRC. Such arrangements appear to be established sometimes in the project plans sent down from higher authorities, but often are made at the discretion and initiative of the units involved. In many of the documented instances of such interaction, the collaborating plants and institutes were physically juxtaposed to one another.

14. (U) Examples of Integration of R&D and Production in Ground-Force Weapon Development

In the following section, a number of facilities involved in the development and production of ground-force weapon systems are listed. A number of examples are cited wherein the R&D activities are collocated with the production plants. These examples are summarized in section V, subsection C.

Section V.

PRC FACILITIES INVOLVED IN DEVELOPMENT AND PRODUCTION OF GROUND-FORCE WEAPON SYSTEMS

A. INTRODUCTION

(U) (C) In section III, the apparent design strategy for current PRC ground-force systems was described. One intent of such analysis was to indicate the degree of R&D involvement for each major ground-force system class. In the following subsection, a concise summary is presented of the major production/R&D facilities responsible for the same set of weapon classes described previously. In section IV, the argument was developed that conventional ground-force weapon R&D facilities are collocated with related production facilities. In subsection C, the evidence for such collocation is summarized, and additional comments are provided.

B. FACILITIES SUMMARIES

1. (U) Developmental and Production Facilities

Table II contains a listing of the major known facilities involved in ground-force weapon systems development and production.

2. (S-NOFORN) Test Facilities

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Certain test facilities, in addition to those mentioned in table II, may be considered as primary [redacted] Included in this group are the following:

- Chu-jung Electronic Test Facility.
- Nanking Electronic R&D Facility.
- Chih-fang Ordnance and Radar Repair Plant.
- Pai-cheng Weapons Test Range.
- Shuang-cheng-tzu Missile Test Center (SCTMTC).

NOT RELEASABLE TO FOREIGN NATIONALS

Table II. PRC Ground-Force Weapon Development and Production Facilities (U)

System	Location/Plant Number	Products/Comments
Tanks/APCs	Chung-ching Armored Vehicle Plant [redacted]	Believed to be a production facility for armored personnel carriers.
	Ta-tung Plant [redacted]	Tank engines.
	Pao-tou Tank Plant [redacted]	Largest producer of the Type 59 medium tank and the Chinese-designed Type 62 light tank. Facilities include a cross-country test track and weapon testing areas. Some of the Type 62 developmental work was probably done here.
	Chang-hsin-tien Armored Vehicle Development Plant [redacted]	Produces tank engines and is believed to produce the Chinese-designed APC.
	Hsiang-tan Armored Vehicle Plant [redacted]	Produces the Type 63 light amphibious tank.
Mobility systems	Chang-chun Motor Vehicle Plant [redacted]	Primary manufacturer of the CA-10 "Liberation" cargo truck, which represents about 70% of the total PRC truck production.
	Nanking, Tsian, Shanghai	These plants account for an additional 20% of the trucks produced. These vehicles range in size from 1 1/2-ton cargo trucks to 10-ton dump trucks.
Antitank weapons	Hsiang-hsiang Ammunition and Explosives Plant [redacted]	Manufactures the 40-mm HEAT grenades.
	Peking/Han-yang Arms Plant [redacted]	Has produced the 75-mm recoilless rifle and 40-mm grenade launchers. Initially located in the Peking area, the plant has recently been relocated to Han-yang in central China.
Artillery	Chi-chi-ha-erh Army and Ammunition Plant [redacted]	Produces the 122-mm howitzers and the 130-mm field guns. Has an artillery test range located 13 km NE of the plant.

Table II. PRC Ground-Force Weapon Development and Production Facilities (U) (Continued)

System	Location/Plant Number	Products/Comments
Artillery (Continued)	Tai-yuan Artillery Plant [redacted]	Has been a producer of 85-mm and 76-mm guns since the mid-1950s (including artillery, AA guns, and tank guns).
	Pao-tou Artillery Plant [redacted]	Largest arms plant in the PRC. Products include the 57-mm AA gun, the 152-mm gun-howitzer, the 122-mm gun, and the 100-mm D-10T tank gun for mounting on the Type 59 tank produced at the adjacent Plant [redacted]
Rockets and launchers	Hsi-an Plant [redacted]	Products include the Chinese-designed 107-mm rocket launcher. Since this facility reportedly has a design section and a technology section within its structure, the developmental work for the modifications to the Type 63-1 rocket launcher may have been accomplished entirely in-house.
SRBM	The specific facilities involved in R&D and production related to SRBMs have not been identified.	Such efforts are probably conducted within the factories and research academies of the Seventh MMI. These facilities have been described in reference 22; however, specific data regarding SRBMs are lacking.
Mortars	Nanking Mortar Plant [redacted]	Until 1965, this was the only mortar production facility in the PRC. Products include the 60-mm, 82-mm, 120-mm, and 160-mm mortars.
Infantry	Lu-liang Weapons Plant [redacted]	The 12.7-mm and 14.5-mm heavy machineguns are produced here.
	Chung-ching Small Arms Plant [redacted]	Produces the new Type 68 rifle and a 14.5-mm antiaircraft gun.
	Kun-ming Arms Plant [redacted]	According to factory marking analyses, this plant has been the PRC's sole producer of light machineguns. Also credited with the design of the new Chinese 7.62-mm rifle, Type 68. Serves as the PRC's R&D center for infantry weapons.
	Pei-an Small Arms Plant [redacted]	For nearly 20 years, the only known producer of assault rifles. Produced the native-designed 7.65-mm silenced assassination pistol, and was probably involved in the weapon's design.

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Table II. PRC Ground-Force Weapon Development and Production Facilities (U) (Continued)

System	Location/Plant Number	Products/Comments
Antiaircraft gun systems	Chung-ching Arms and Ammunition Plant [redacted]	Has produced the 75-mm recoilless rifle. Present products include fire control mechanisms and both the single and dual models of the 37-mm AA guns. The plant is reported to have trial-produced new products.
		See the artillery portion of this table for additional AA gun system production facilities.
SAM	Shen-yang Airframe Plant [redacted]	This plant, subordinate to the Third MMI, is the primary facility in the PRC for the manufacture of the CSA-1, the Chinese version of the Soviet SA-2 (GUIDELINE) surface-to-air missile.
	Tai-yuan Explosives and Solid Motor Production Plant [redacted]	Produces explosives, TNT, ammunition, small arms, and solid rocket propellant for use in the CSA-1.
CBW	Lu-chou Plant [redacted]	Produced military protective masks and protective clothing during World War II and more recently has produced mustard, adamsite, and chloroacetophenone.
	Ping-shih-hsu [redacted]	Reportedly is to produce tear, blister, choking, and other chemical warfare agents.
	Tai-yuan [redacted]	Allegedly produces napalm bombs, CW agents, and protective masks.
Helicopters	Ha-erh-pin Airframe Plant [redacted]	Produces the Hound (MI-4)
Engineer equipment		Construction equipment, including bulldozers, excavators, trench diggers, construction cranes, and road rollers, are produced within the PRC in limited numbers. Although there are at least 11 producers of construction equipment, the PRC must still rely heavily on imports to meet its requirements. The many shipyards and similar facilities would produce [redacted] bridging and stream-crossing equipment for use by the PLA.

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Table II. PRC Ground-Force Weapon Development and Production Facilities (U) (Continued)

System	Location/Plant Number	Products/Comments
Ammunition	Chung-ching Ammunition Plant [redacted]	Manufactures small arms and artillery ammunition. Engages in trial production.
	Ch'ang-chih Plant [redacted]	Produces fuzes for mortar ammunition, antitank grenades, and rockets.
	Shen-yang Plant [redacted]	Produces small arms ammunition. Sixth largest loading plant in the PRC.
	Chi-lin Plant [redacted]	Artillery ammunition, fuzes, explosives, and explosive munitions.
	Shen-yang Plant [redacted]	A former Japanese arsenal, now the seventh largest ammunition plant in China. Produces artillery and mortar rounds, and is the sole producer of aerial bombs.
Optical devices	Kun-ming Optical Instrument Plant and Arsenal [redacted]	Produces antiaircraft, recoilless rifle, and mortar sights and optical fire control equipment. Although subordinate to the Fifth MMI, the plant has at various times been under the technical supervision of East German and Soviet experts.

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C. SUMMARY OF INDICATORS OF COLLOCATION OF R&D WITH PRODUCTION PLANTS

3. (S) Summary of Evidence

The facility summaries in section V, subsection B provide sufficient evidence supporting the postulation that the conventional ground-weapon plants are also the R&D centers for such weapon systems. For the significant ground-force R&D actions summarized in section III-3, appropriate R&D facilities have been identified at the related production plants. The only exception is in the antitank weapon area, where evidence is lacking regarding the location of the developmental work leading to the significant weight reduction of antitank weapons. In the other major areas, the evidence is as follows:

a. Tanks and APCs: Developmental activities are conducted at the armored vehicle research facility of the Chang-hsin-tien Armored Vehicle Development Plant [redacted]

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b. Artillery: Plants [redacted] appear to have adequate facilities for the design improvements noted on the Type 59-1 130-mm gun.

c. Rockets and Launchers: Plant [redacted] is the probable developer of the Chinese-designed 107-mm rocket launcher.

d. Small Arms: Kun-ming Arms Plant [redacted] has been identified as the PRC research and development center for infantry weapons and is credited with the design effort on the excellent Type 68 rifle.

[redacted]

Section VI.

ASSESSMENT, GAPS, AND FORECAST

A. FINDINGS REGARDING PRC GROUND-FORCE R&D SYSTEM AND INTELLIGENCE GAPS

1. (C) Findings

a. As discussed in sections I, II, and IV, the organization for ground-force weapon RDTE appears to differ from that for "advanced systems" in the following respects: The "system" for such RDTE, while formally part of the general "national defense science and technology system," apparently is more compartmentalized within the infrastructure of a single agency (the Fifth MMI) than are some of the other military product areas. Indications are that that Ministry and its associated elements have little interaction with other R&D elements, such as those of the Academy of Sciences or the other defense industrial MMIs. Further, within this relatively self-contained system, the organization for R&D seems to be centered more closely on production facilities and less on "stand-alone" R&D institutions than, for example, in either the aerosystem or the missile sector.

b. The involvement of the NDSTC in advanced weapon system development has been established in previous sections of this study, but there is an absence of evidence of any direct interaction between the NDSTC and the Fifth MMI. This would suggest an alternate method of weapon development management within this Ministry. Because of the concentration of RDTE resources within the production sector of the Fifth MMI, it is postulated that the primary R&D management mechanism for these products is the MND/PLA's GRSD, interacting with the Fifth MMI through its network of middle-echelon units under the service arms and military representative units on-site at plants. The extent to which other technical units of the PLA service arms may be involved in such management is unknown. The RDTE activities of plants within the defense industrial sector are difficult to assess, particularly with respect to armament and munition plants. Substantive information about individual armament and munition plants is extremely sparse; the bulk of the knowledge concerning most of these facilities comes from the interpretation and analysis [redacted] There is some evidence to indicate these defense plants include the standard internal units for design, technological, and laboratory work found in other PRC plants. While very little is known of the internal operations of armament and munition plants, there is ample reason to propose that significant research, design, and development work is conducted at those installations. This

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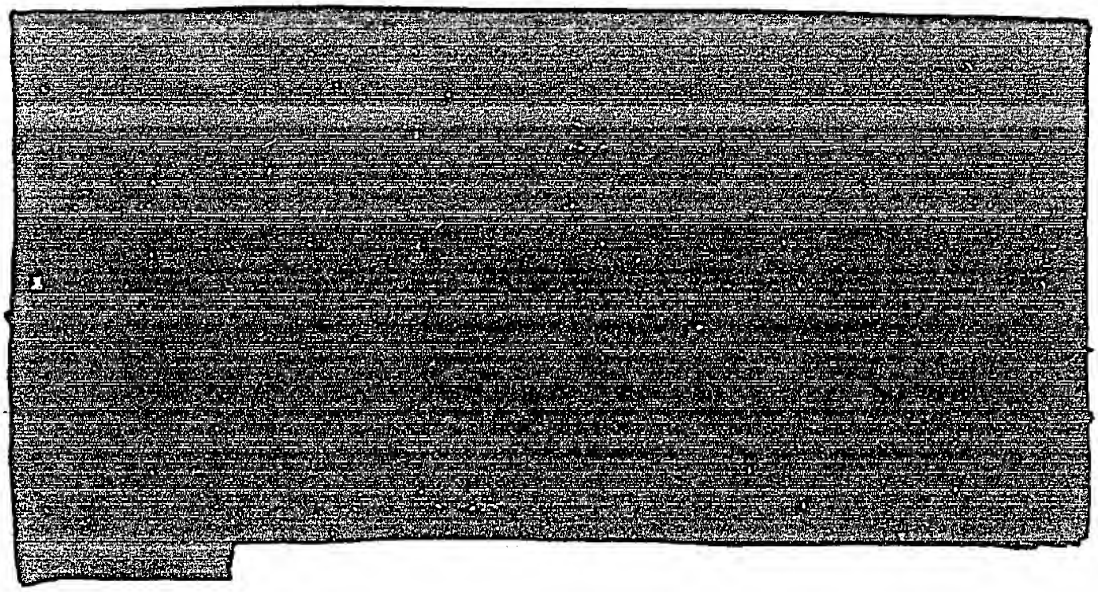
estimate is based upon two realizations: First, no significant installations for ground-weapon R&D have been identified at other locations in the PRC. Second, the high degree of product specialization at the various arms plants makes the collocation of related R&D operations logical and attractive. It follows that such R&D elements by nature are very much oriented around production technology and engineering problems, design copying, and redesigning of equipment.

2. (S) Intelligence Gaps



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B. FORECAST AND RESOURCE INDICATORS

3. (U) (S) Present Design Strategy and Alternative Future Strategies

a. As shown in section III, the present PRC design approach for ground-force systems utilizes a hybrid developmental strategy based on copying Soviet systems, product improvements, and native designs supplemented by imports and copying of older US/Japanese systems. Such a design strategy requires a relatively limited design capability and R&D resources base.

b. The basic technology available in the Soviet-supplied systems dates back to the 1950s and earlier; therefore, the PRC is faced with the problem of developing a suitable, long-term strategy to avoid or minimize increasing technological obsolescence.

c. At least three possible alternative future design strategies can be postulated for 1975 to 1985. These are:

(1) Status quo. Stress on production of existing systems and limited indigenous advanced design effort.

(2) Stress on production of existing systems, additional incremental improvements, and advanced design effort in selected areas.

(3) Broad effort to obtain capability for advanced design capability in most areas (i.e., as was done in the PRC aircraft industry). Such a strategy would involve a concentrated effort to move from level 4 to level 7 or 9 on the scale shown in figure 7.

4. (U/~~S~~) Most Probable Future Design Strategy

Faced with the need to minimize technological obsolescence, adapt Soviet systems to unique PRC requirements, and meet changing threats, the PRC's most probable future developmental strategy for ground-force systems is as follows: stress on continued production of existing systems, and incremental modifications to achieve improvements/adaptations, supplemented by advanced design effort in selected areas. Possible candidate areas for advanced design effort are the antitank and tactical air defense systems (based on threat and relative technological inferiority) and ammunition (based on relative technological inferiority and probable exploitation of more advanced US and Soviet ammunition systems from the Vietnam War).

5. (~~S~~) Areas to be Monitored to Detect Changes in Developmental Strategy

The following areas may provide leading indicators of PRC efforts to achieve significant design improvements or to develop more advanced native designs:

- [redacted]
- [redacted]
- [redacted]
- [redacted]

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- [redacted]
- [redacted]

6. (S) Future Efforts

Future collection and analytical efforts will be directed toward:

[redacted]

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DISTRIBUTION BY NPFC PHILADELPHIA (35 copies)

NAVY		NAVY COMMANDS		NAVY COMMANDS (Continued)	
D157	NISO JAPAN	J505	COMNAVAIRLANT	K605	FMFPAC
D161	NISO SUBIC BAY	J515	FICEURLANT	K612	THIRDMARDIV
D217	NAVWPNCEN	J593	COMPTEVFOR	K650	COMNAVSURFPAC
D246	NAVSURFWPNCEN DAHL	J576	COMPHIBGRU 2	K658	COMUSNAVPHIL
D249	NAVPGSCOL	K500	CINCPACFLT	K610	FIRSTMARDIV
D261	NUSC NPT	K505	FICPAC	K632	III MARPHIBFORFMF
D506	NAVUSEACEN	K514	COMTHIRDFLT	K679	FLTCORGRU 1
D5e1	NWEPEVLFAC KIRTLND	K515	COMSEVENTHFLT	K991	FITCPAC
D700	COMCDEC	K601	FIRSTMAW		

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DOD AND JOINT AGENCIES		ARMY (Continued)		ARMY (Continued)	
A210	DMAAC	C043	USAMIIA	C305	18TH ABN CORPS
A353	JSTPS	C052	CH OF ENGINEERS	C309	DET N 500TH MIG
		C202	III CORPS	C428	OP TEST & EVAL AGCY
ARMY		C204	MASSTER	C454	FLD ARTY SCH
		C239	D CO/519 MI BN (FLDA)	C460	ENGINEER SCH
C020	DCS-MIL OPS	C242	FORSCOM	C461	INFANTRY SCH
C021	DCS-LOG	C264	JAG	C463	INTEL CTR & SCH (2)

DISTRIBUTION DIRECT TO THE RECIPIENT (Continued)

ARMY (Continued)

C470 ARMY WAR COL (2)
C500 HQ TRADOC
C507 FORSIG
C539 TRASANA
C547 ARMY NUCLEAR AGCY
C557 USAIIC
C587 CMBT DEV EXPR COMD
C605 JFK CTR MIL ASSIST
C617 CONCEPT ANALYS AGCY
C620 USASRD
C632 ORD CTR & SCH
C635 AIR DEF AGCY
C637 ARMY ARMOR SCH
C639 CMBT & TNG DEV DIR
C641 AVIATION SCHOOL
C644 LOG CTR
C683 ASA
C759 COLL DET USAIA
C765 OACSI-CI ANALYSDET
C766 OACSI-INT SUP DET
C768 OACSI-USAITAD
C787 OACSI-EASTERN BR
C646 CMBARMSCMBTDEVACTY
C763 OACSI-S & T DIV

AIR FORCE

E017 AF/RDQLR-W
E018 AF/RDQLR-C
E046 7602 AIG/INXE

AIR FORCE (Continued)

E100 TAC (9TH TIS/LDD)
E200 AAC
E408 AFWL
E411 ASD/FTD/ETID
E420 FTD (5)
E436 AFEWC (SUR)
E451 AUL/LSE

U & S COMMANDS

G005 CINCAD
G300 BMDOA
H006 USEUCOM DEFANALCTR
H300 USAICE (USAREUR)
K005 CINCPAC
K010 COMUSKOREA
K020 COMUSTDC
K100 PACAF 548 RTG
K115 5TH AF
K300 IPAC (CODE 623)
K304 USATSA-FED
K320 USARJAPAN
L040 SAC 544TH ARTW
N005 USREDCOM

ARMY MATERIEL COMMAND

AMCRD-IF
AMXNM-ZSF
AMSEL-RD-I

ARMY MATERIEL-COMMAND (Continued)

AMSMI-YDR
AMSTA-RI
AMXFB-Y
AMSAV-ED
AMSAR-RDI
SARWV-FIO
SARFA-FI
SARPA-FIO
AMSTE-TO-F
AMXBR-XA-FI
STEWS-TE-PO

USAFSTC

AMXST-PS1 (2)
AMXST-IS3 (25)
AMXST-CX
AMXST-SD (2)
AMXST-MC (3)
AMXST-ST2
AMXST-ST3
AMXST-IS1

TOTAL DISTRIBUTION: 283 copies